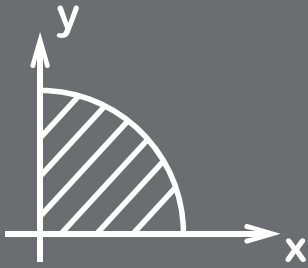


Based on the Guidelines of National Education Policy (NEP)-2020
and Syllabus prescribed by N.C.E.R.T.



Intellectual **MATHEMATICS**

Author :
Sandeep Kashyap
(M.Sc., B.Ed.)

Help Kit : 6



Exercise 1.1

- (a) 3,68,945
Three lakh sixty-eight thousand nine hundred forty-five.
 - (b) 9,99,999
Nine lakh ninety-nine thousand nine hundred ninety-nine.
 - (c) 8,53,69,450
Eight crore fifty-three lakh sixty-nine thousand four hundred fifty.
 - (d) 8,88,00,057
Eight crore eighty-eight lakh fifty-seven.
- (a) 9,834,251
Nine million eight hundred thirty-four thousand two hundred fifty-one.
 - (b) 99,985,102
Ninety-nine million nine hundred eighty-five thousand one hundred two.
 - (c) 960,054,331
Nine hundred sixty million fifty-four thousand three hundred thirty-one.
 - (d) 83,410,203
Eighty-three million four hundred ten thousand two hundred three.
- (a) 973,055 (b) 3,03,00,082
(c) 48,115,708 (d) 55,90,010
(e) 7,000,070 (f) 136,000,000
(g) 809,000,021 (h) 4,200,000
- (a) $5,03,557 = 5 \times 1,00,000 + 3 \times 1,000 + 5 \times 100 + 5 \times 10 + 7 \times 1$
 - (b) $34,05,804 = 3 \times 10,00,000 + 4 \times 1,00,000 + 5 \times 1,000 + 8 \times 100 + 4 \times 1$
 - (c) $5,05,05,005 = 5 \times 1,00,00,000 + 5 \times 1,00,000 + 5 \times 1,000 + 5 \times 1$
 - (d) $3,04,57,099 = 3 \times 1,00,00,000 + 4 \times 1,00,000 + 5 \times 10,000 + 7 \times 1,000 + 90 + 9 \times 1$
- (a) 9,86,522 (b) 23,85,936 (c) 4,60,000
- (a) In the number 694;
The place value of 9 is 90 and face value of 9 is 9.
 - (b) In the number 97,652;
The place value of 9 is 90,000 and face value of 9 is 9.
 - (c) In the number 54,693;
The place value of 9 is 90 and face value of 9 is 9.
 - (d) In the number 7,93,265;
The place value of 9 is 90000 and face value of 9 is 9.
- In the number 67,20,659 :
The difference between the place value of two 6's
= 60,00,000 – 600
= 59,99,400

Mental Maths

- 1 million = 10 lakh
- 1 crore = 100 lakh
- lakh = 100 thousands
- 1 crore = 10 million
- 1 billion = 1000 million

Exercise 1.2

- (a) 6845 3846 (b) 78,462 6,84,312
(c) 9,87,653 98,73,521 (d) 10,89,642 10,93,461
(e) 99,999 10,000
- Ascending order = 92,354 < 98,432 < 3,21, 157 < 3,84,651 < 4,27,554
- Descending order = 90,05,20,184 > 9,50,09,481 > 9,48,10,095 > 9,40,09,581 > 9,05,04,518
- Greatest four digit numbers Smallest four digit numbers
(a) 7765 5567
(b) 8850 5008
(c) 4420 2004
(d) 9931 1139
- Greatest four-digit numbers Smallest four digit numbers
(a) 9873 3789
(b) 9432 2349
(c) 8650 5068
(d) 4310 1034
- To form the smallest eight-digit number from four digits, you should take the four smallest digits which are 0, 1, 2 and 3. Hence, the required eight-digit number is 10000023.
- Keeping 4 at the once place, the numbers formed are 584 and 854.
Keeping 5 at the once place, we have 485 and 845.
Keeping 8 at the once place, we have 458 and 548.
So, the required numbers are 458, 485, 548, 584, 845 and 854.
- To form the greatest four digit number from two different digits, you should take the two greatest digit which are 9 and 8. Hence, the required four-digit number is 9998.
- Five six-digit numbers using the digits 4, 0, 5 are 504045, 454504, 404050, 404450 and 440055.
- Five six-digit numbers using the digits 3, 4, 0, 6, 7 are 7,65,430; 6,75,430; 5,76,430; 3,74,056 and 4,57,360
So, ascending order = 3,74,056 < 4,57,360 < 5,76,430 < 6,75,430 < 7,65,430

HOTS

The greatest seven-digit number = 99,99,999
Now, the preceding five numbers of 99,99,999 are 99,99,998; 99,99,997; 99,99,996; 99,99,995 and 99,99,994.
So, descending order : 99,99,999 > 99,99,998 > 99,99,997 > 99,99,996 > 99,99,995 > 99,99,994.

The smallest six-digit number = 1,00,000

Now, the succeeding five numbers of 1,00,000 are 1,00,001; 1,00,002; 1,00,003; 1,00,004 and 1,00,005.

So, ascending order : 1,00,001 < 1,00,002 < 1,00,003 < 1,00,004 < 1,00,005.

Exercise 1.3

- The cost of 20 tons of iron = ₹ 1,20,000
 \therefore the cost of 1 ton of iron = ₹ 1,20,000 \div 20 = ₹ 6000
 $[\because 1 \text{ ton} = 1000 \text{ kg}]$
 The cost of 1 kg of iron = ₹ 6000 \div 1000 = ₹ 6
 The cost of 280 kg of iron = ₹ 6 \times 280 = ₹ 1680
 Thus, the cost of 280 kg of iron is ₹ 1680.
- Using 14 L of petrol, car travels = 224 km.
 \therefore using 1 L of petrol, car travels = 224 \div 14 = 16 km
 Thus using 20 L of petrol, car travels = 16 \times 20 = 320 km.
 Hence, the car will travel 320 km of distance using 20 litre of petrol.
- Atul's annual salary = ₹ 6,70,200
 Thus his monthly salary = ₹ 6,70,200 \div 12 = ₹ 55,850
- The capacity of a water tank = 1020 L
 The capacity of a bucket = 20 L
 \therefore The number of required buckets = 1020 \div 20 = 51
 Hence, 51 buckets can be filled from the water tank.
- Student added = 196 + 67,394 = 67,590
 But he was supposed to addition = 169 + 67,394 = 67,563
 Thus, his answer greater than the correct answer = 67,590 - 67,563 = 27
- Meenu Multiplied = 84,352 \times 57
 But she was supposed to multiply = 84,352 \times 75
 So, difference in answer = 84,352 \times 75 - 84,352 \times 57 = 84,352 (75 - 57) = 84,352 \times 18 = 15,18,336
 Hence, her answer was 15,18,336 less than the correct answer.
- Peter multiplied = 64,283 \times 54
 But he was supposed to multiply = 64,283 \times 45
 So, difference in answer = 64,283 \times 54 - 64,283 \times 45 = 64,283 (54 - 45) = 64,283 \times 9 = 5,78,547
 Hence, his answer was 5,78,547 greater than the correct answer.
- A dealer has money = ₹ 2,48,500
 The cost of 1 cooler = ₹ 4500
 \therefore The cost of 50 coolers = ₹ 4500 \times 50 = ₹ 2,25,000
 \therefore The money remain left = ₹ 2,48,500 - 2,25,000 = ₹ 23,500
- In 625 km, used of fuel = 25 L
 \therefore In 1 km, used of fuel = (25 \div 625) L
 \therefore In 25 km, used of fuel = $\frac{25}{625} \times 25$ = 1L, yes

- (a) The distance from C to B = 2170 km.
 The distance from B to A = 1350 km.
 \therefore The total distance from C to A through B = (2170 + 1350) km = 3520 km
- (b) The distance from A to E = 1500 km
 The distance from E to D = 1280 km.
 \therefore The total distance from A to D through E = (1500 + 1280) km = 2780 km
- (c) The distance from C to E = 1490 km
 The distance from E to A = 1500 km
 And the distance from A to B = 1350 km
 \therefore The total distance from C to B through E and A = (1490 + 1500 + 1350) km = 4340 km.
- (d) The distance from A to E = 1500 km
 The distance from E to D = 1280 km
 The distance from D to C = 2160 km
 And the distance from C to B = 2170 km
 \therefore The total distance from A to B through E, D and C = (1500 + 1280 + 2160 + 2170) km = 7110 km.

Exercise 1.4

- (a) 1360 (b) 9000 (c) 7400
 (d) 13000 (e) 48230
- (a) 456 + 285

$$\begin{array}{r} 456 \\ + 285 \\ \hline 741 \end{array}$$
 456 round off to 460
 285 round off to + 290

$$\begin{array}{r} 460 \\ + 290 \\ \hline 750 \end{array}$$
 Thus, the estimated sum is 750.
- (b) 630 + 992

$$\begin{array}{r} 630 \\ + 992 \\ \hline 1622 \end{array}$$
 630 round off to 600
 992 round off to + 1000

$$\begin{array}{r} 600 \\ + 1000 \\ \hline 1600 \end{array}$$
 Thus, the estimated sum is 1600.
- (c) 794 - 312

$$\begin{array}{r} 794 \\ - 312 \\ \hline 482 \end{array}$$
 794 round off to 800
 312 round off to - 300

$$\begin{array}{r} 800 \\ - 300 \\ \hline 500 \end{array}$$
 Thus, the estimated difference is 500.
- (d) 14,805 + 3,885

$$\begin{array}{r} 14805 \\ + 3885 \\ \hline 18690 \end{array}$$
 14805 round off to 15000
 3885 round off to + 4000

$$\begin{array}{r} 15000 \\ + 4000 \\ \hline 19000 \end{array}$$
 Thus, the estimated sum is 19000.
- (e) 37,646 - 21,248

$$\begin{array}{r} 37646 \\ - 21248 \\ \hline 16398 \end{array}$$
 37646 round off to 38000
 21248 round off to - 21000

$$\begin{array}{r} 38000 \\ - 21000 \\ \hline 17000 \end{array}$$
 Thus, the estimated difference is 17000.
- (f) 52 \times 68

$$\begin{array}{r} 52 \\ \times 68 \\ \hline 3536 \end{array}$$
 52 round off to 50
 68 round off to \times 70

$$\begin{array}{r} 50 \\ \times 70 \\ \hline 3500 \end{array}$$
 Thus, estimated product is 3500.
- (g) 84 \div 23

$$\begin{array}{r} 84 \\ \div 23 \\ \hline 3 \text{ R } 15 \end{array}$$
 84 round off to 80
 23 round off to 20
 So, 80 \div 20 = 4
 Thus, the estimated division is 4.
- (h) 687 \times 273

$$\begin{array}{r} 687 \\ \times 273 \\ \hline 18729 \end{array}$$
 687 round off to 700
 273 round off to \times 300

$$\begin{array}{r} 700 \\ \times 300 \\ \hline 210000 \end{array}$$
 Thus, the estimated product is 210000.

(i) 5281×3491
 $\underline{5281}$ round off to 5000
 $\underline{3491}$ round off to $\times 3000$
 $\underline{15000000}$

Thus, the estimated product is 15000000.

(k) 578×369
 $\underline{578}$ round off to 600
 $\underline{369}$ round off to $\times 400$
 $\underline{240000}$

Thus, the estimated product is 240000.

3. (a) $546 + 684 + 7316$
 $\underline{546}$ round off to 500
 $\underline{684}$ round off to 700
 $\underline{7316}$ round off to $+ 7300$
 $\underline{8500}$

Thus, the estimated sum is 8500.

(b) $109834 - 48799$
 $\underline{109834}$ round off to 110000
 $\underline{48799}$ round off to $- 48000$
 $\underline{61000}$

Thus, the estimated difference is 61000.

(c) $9681 - 532$
 $\underline{9681}$ round off to 9700
 $\underline{532}$ round off to $- 500$
 $\underline{9200}$

Thus, the estimated difference is 9200.

(d) $35864 - 28679$
 $\underline{35,864}$ round off to 36000
 $\underline{28,679}$ round off to $- 29000$
 $\underline{7000}$

Thus, the estimated difference is 7000.

(e) $5,69462 + 4,71340$
 $\underline{5,69,462}$ round off to 570000
 $\underline{4,71,340}$ round off to $+ 470000$
 $\underline{10,40,000}$

Thus, the estimated sum is 10,40,000.

Exercise 1.5

1. (a) $38 = 30 + 5 + 3$
 $= XXX + V + III$
 $= XXXVIII$
- (b) $43 = 40 + 3$
 $= (50 - 10) + 3$
 $= XL + III = XLIII$
- (c) $61 = 50 + 10 + 1$
 $= L + X + I$
 $= LXI$
- (d) $95 = 90 + 5$
 $= (100 - 10) + 5$
 $= XC + V = XCV$
- (e) $99 = 90 + 9$
 $= (100 - 10) + (10 - 1)$
 $= XC + IX = XCIX$
- (f) $164 = 100 + 50 + 10 + 4$
 $= C + L + X + IV$
 $= CLXIV$
- (g) $226 = 100 + 100 + 10 + 10 + 5 + 1$
 $= C + C + X + X + V + I = CCXXVI$
- (h) $310 = 300 + 10$
 $= C + C + C + X$
 $= CCCX$

2. (a) $XIII = 10 + 1 + 1 + 1 = 10 + 3 = 13$
(b) $XV = 10 + 5 = 15$
(c) $XXXI = 10 + 10 + 10 + 1 = 31$
(d) $XXVII = 10 + 10 + 5 + 1 + 1 = 20 + 7 = 27$
(e) $XLV = (50 - 10) + 5 = 40 + 5 = 45$
(f) $LIV = 50 + (5 - 1) = 50 + 4 = 54$
(g) $LX = 50 + 10 = 60$
(h) $XC = (100 - 10) = 90$
(i) $LXXXIX = 50 + 10 + 10 + 10 + (10 - 1)$
 $= 50 + 30 + 9 = 89$
(j) $XCI = (100 - 10) + 1 = 91$
(k) $CXI = 100 + 10 + 1 = 111$
(l) $CLIV = 100 + 50 + (5 - 1) = 154$
3. (a) 990 (b) 2100 (c) 160
(d) L (e) XLVIII

MCQ's

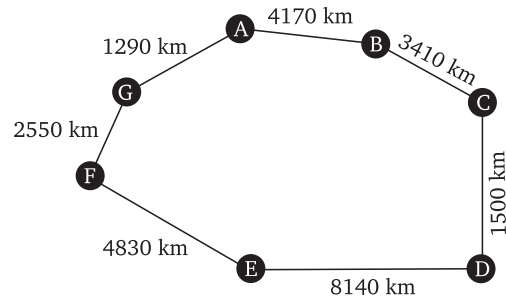
1. c 2. a 3. b 4. b 5. d 6. b 7. b 8. b 9. b 10. b

NEP : Cross-Cultural Learning

- (a) Distance from A to $B = 4170$ km
Speed of bus = 60 km/hr
 \therefore Time taken by bus from A to B

$$= \left(\frac{4170}{60} \right) \text{hr}$$

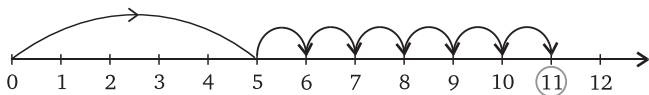
$$= 69 \text{ hours } 30 \text{ minutes.}$$



- (b) Distance from C to $D = 5100$ km
 \therefore Time taken by bus from C to D
- $$= \left(\frac{5100}{60} \right) \text{hr}$$
- $$= 85 \text{ hours}$$
- (c) Distance from E to $G = (4830 + 2550)$ km = 7380 km
 \therefore Time taken by bus from E to G
- $$= \left(\frac{7380}{60} \right) \text{hr}$$
- $$= 123 \text{ hours}$$
- (d) Total journey
 $= (4170 + 3410 + 1500 + 8140 + 4830 + 2550 + 1290)$ km
 $= 25,890$ km
 \therefore Time taken by bus in total journey
- $$= \left(\frac{25,890}{60} \right) \text{hr}$$
- $$= 431 \text{ hours } 30 \text{ minutes.}$$

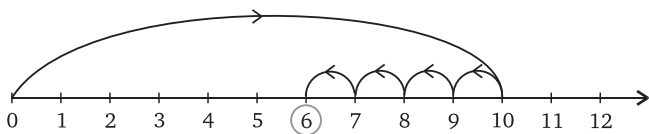
Exercise 2.1

1. (a) Successor of 10799 = $10799 + 1 = 10800$
 And Successor of 10800 = $10800 + 1 = 10801$
 So, the two successors of 10799 is 10800 and 10801.
- (b) Successor of 20999 = $20999 + 1 = 21000$
 And Successor of 21000 = $21000 + 1 = 21001$
 So, the two successors of 20999 is 21000 and 21001.
2. (a) Predecessor of 20010 = $20010 - 1 = 20009$
 Predecessor of 20009 = $20009 - 1 = 20008$
 And Predecessor of 20008 = $20008 - 1 = 20007$
 So, the three predecessors of 20010 is 20009, 20008 and 20007.
- (b) Predecessor of 9999 = $9999 - 1 = 9998$
 Predecessor of 9998 = $9998 - 1 = 9997$
 And predecessor of 9997 = $9997 - 1 = 9996$
 So, the three predecessors of 9999 is 9998, 9997 and 9996.
3. The natural numbers between 59 and 72 are 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71.
 So, there are 12 natural numbers between 59 and 72.
4. (a) $5 + 6$



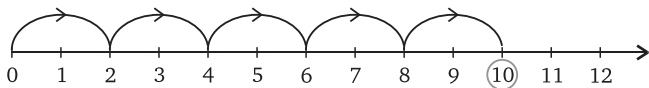
$$\therefore 5 + 6 = 11.$$

(b) $10 - 4$



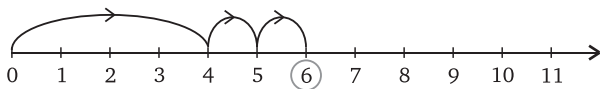
$$\therefore 10 - 4 = 6.$$

(c) 2×5



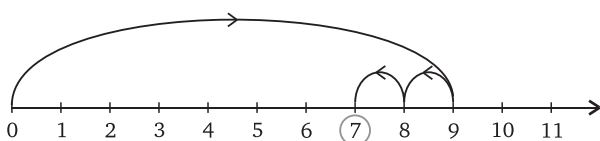
$$\therefore 2 \times 5 = 10.$$

(d) $4 + 2$



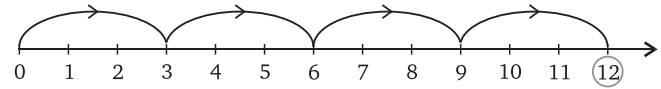
$$\therefore 4 + 2 = 6.$$

(e) $9 - 2$



$$\therefore 9 - 2 = 7.$$

(f) 3×4



$$\therefore 3 \times 4 = 12.$$

5. (a) F (b) T (c) T (d) F
 (e) F (f) F (g) T

Exercise 2.2

1. (a)

3	0	5	3
-	1	2	1
1	8	4	2

 (b)

4	0	0	3	7	
-	1	4	3	7	2
2	5	6	6	5	
2. (a) Multiplicative identity
 (b) Additive identity
 (c) Commutative property for subtraction.
 (d) Associative property for multiplication.
 (e) Distributive property of multiplication over subtraction.
3. (a) $75 \times 71 + 29 \times 75$
 $= 75 \times (71 + 29)$
 Distributive property of multiplication over addition.
 $= 75 \times 100$
 $= 7500$
- (b) $135 \times 105 = (100 + 35) \times (100 + 5)$
 $= 100 \times 100 + 100 \times 5 + 100 \times 35 + 35 \times 5$
 $= 10000 + 500 + 3500 + 175$
 $= 14175$
 Distributive property of multiplication over addition.
- (c) $393 \times 435 - 35 \times 393$
 $= 393(435 - 35)$
 Distributive property of multiplication over subtraction.
 $= 393 \times 400$
 $= 157200$
- (d) 25×94
 $= 25 \times (100 - 6)$
 Distributive property of multiplication over subtraction.
 $= 25 \times 100 - 25 \times 6$
 $= 2500 - 150 = 2350$
- (e) $350 \times 25 + 35 \times 10 \times 21$
 $= 35 \times 10 \times 25 + 35 \times 10 \times 21$
 $= 35 \times 10 \times (25 + 21)$
 Distributive property of multiplication over addition.
 $= 350 \times 46 = 16100$
- (f) $250 \times 8 + 25 \times 10 \times 9$
 $= 250 \times 8 + 250 \times 9$
 $= 250 \times (8 + 9)$
 Distributive property of multiplication over addition.
 $= 250 \times 17$
 $= 4250$

(g) $546 \times 999 + 546$
 Distributive property of multiplication over addition.
 $= 546 \times (999 + 1)$
 $= 546 \times 1000$
 $= 546000$

(h) $3845 \times 5 \times 782 + 769 \times 25 \times 218$
 $= 3845 \times 5 \times 782 + (769 \times 5) \times 5 \times 218$
 $= 3845 \times 5 \times 782 + 3845 \times 5 \times 218$
 $= 3845 \times 5 \times (782 + 218)$
 Distributive property of multiplication over addition.
 $= 3845 \times 5 \times 1000$
 $= 19225000$

4. (a) True (b) True (c) False (d) True (e) False

5. $a \div 11$ (given)
 quotient = 5, remainder = 1
 We know that,
 Dividend = Divisor \times Quotient + Remainder
 $a = 11 \times 5 + 1$
 $a = 55 + 1$
 Hence, $a = 56$

6. The greatest 4-digit number = 9999

$$\begin{array}{r} \therefore \quad 70 \overline{)9999} \quad (142) \\ \underline{-70} \\ 299 \\ \underline{-280} \\ 199 \\ \underline{-140} \\ 59 \text{ R} \end{array}$$

$\therefore 59 < 70$
 Hence, the greatest 4-digit number exactly divisible by 70 is
 $= 9999 - 59 = 9940$

HOTS

\therefore Dividend = Divisor \times Quotient + Remainder
 $92197 = 35 \times 2634 + R$
 $92197 = 92190 + R$
 \therefore Hence, the remainder is 7.
 Total number of plants = 357
 And, the number of rows of plants = 17
 \therefore Number of plants in each row = $357 \div 17 = 21$
 Hence, there are 21 plants in each row.

Exercise 2.3

1. (a) $40 + [80 + \{(20 - 3) \times 7\}]$
 $= 40 + [80 + \{17 \times 7\}]$
 $= 40 + [80 + 119]$
 $= 40 + 199 = 239$
 (b) $240 \div [8 + \{24 \times (10 - 7)\}]$
 $= 240 \div [8 + \{24 \times 3\}]$
 $= 240 \div [8 + 72]$
 $= 240 \div 80 = 3$
 (c) $\{(112 + 3) - (5 \times 10 - 17) + 6\} \div 4$
 $= \{115 - (50 - 17) + 6\} \div 4$
 $= \{115 - 33 + 6\} \div 4$
 $= \{82 + 6\} \div 4$
 $= 88 \div 4 = 22$

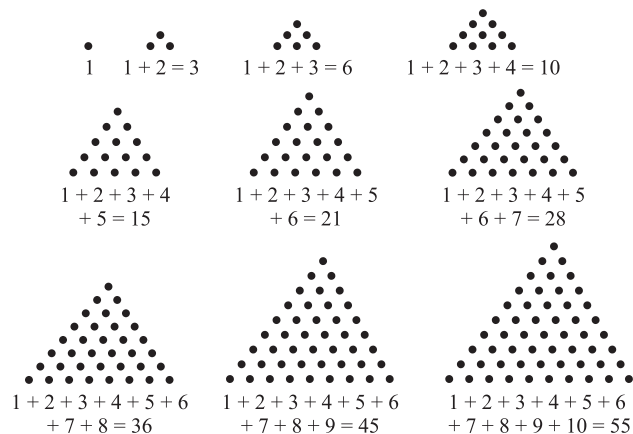
(d) 25 of $[70 - \{9 \times 7 + (14 - 3 \text{ of } 4)\}]$
 $= 25 \times [70 - \{63 + (14 - 3 \times 4)\}]$
 $= 25 \times [70 - \{63 + (14 - 12)\}]$
 $= 25 \times [70 - \{63 + 2\}]$
 $= 25 \times [70 - 65]$
 $= 25 \times 5$
 $= 125$

(e) $(12 \times 3) \div 4 \times 5 - 7 + 3 \times (9 - 5)$
 $= 36 \div 4 \times 5 - 7 + 3 \times 4$
 $= 9 \times 5 - 7 + 12$
 $= 45 - 7 + 12$
 $= 38 + 12$
 $= 50$

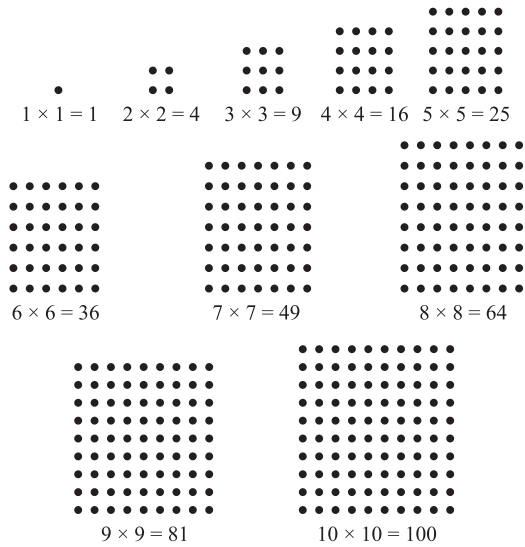
2. (a) $25 - [20 - \{10 - (7 - 5 + 3)\}]$
 $= 25 - [20 - \{10 - (10 - 5)\}]$
 $= 25 - [20 - \{10 - 5\}]$
 $= 25 - [20 - 5]$
 $= 25 - 15$
 $= 10$
 (b) $6 + [12 - \{8 + 3 - (9 \text{ of } 6 - 13 \times 4 + 1)\}]$
 $= 6 + [12 - \{8 + 3 - (9 \times 6 - 13 \times 4 + 1)\}]$
 $= 6 + [12 - \{11 - (54 - 52 + 1)\}]$
 $= 6 + [12 - \{11 - 3\}]$
 $= 6 + [12 - 8]$
 $= 6 + 4 = 10$
 (c) $20 - \{6 + 4 - (4 \times 2 - 3 + 5)\}$
 $= 20 - [10 - (8 - 8)]$
 $= 20 - [10 - 0]$
 $= 20 - 10 = 10$
 (d) $37 + 26 \div 2 + 2$ of $25 - 60 \div 2$
 $= 37 + 13 + 2 \times 25 - 30$
 $= 50 + 50 - 30$
 $= 100 - 30 = 70$
 (e) $30 \div (2$ of $4 + 11 - 4) + 7$
 $= 30 \div (2 \times 4 + 11 - 4) + 7$
 $= 30 \div (8 + 11 - 4) + 7$
 $= 30 \div (19 - 4) + 7$
 $= 30 \div 15 + 7$
 $= 2 + 7 = 9$

Exercise 2.4

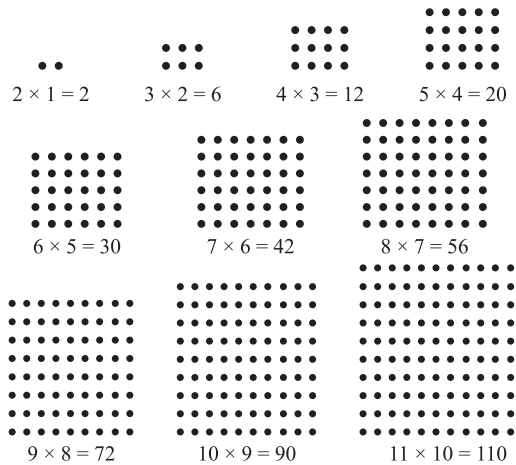
1. (a) First ten triangular numbers



(b) First ten square numbers :



(c) First ten rectangular numbers :



2. (a)

$$\begin{aligned}
 1 \times 8 + 1 &= 9 \\
 12 \times 8 + 2 &= 98 \\
 123 \times 8 + 3 &= 987 \\
 1234 \times 8 + 4 &= 9876 \\
 12345 \times 8 + 5 &= 98765 \\
 123456 \times 8 + 6 &= 987654
 \end{aligned}$$

(b) 1, 2, 4, 7, 11, 16, 22, 29, 37, 46.

(c)

$$\begin{aligned}
 1 \times 11 &= 11 \\
 11 \times 11 &= 121 \\
 111 \times 11 &= 1221 \\
 1111 \times 11 &= 12221 \\
 11111 \times 11 &= 122221 \\
 111111 \times 11 &= 1222221
 \end{aligned}$$

3. We know that,
 No. of dots = $2n + 2$
 When, $n = 4$ (where, n No. of Quadrilateral)
 \therefore No. of dots = $2 \times 4 + 2 = 8 + 2 = 10$
 When, $n = 6$
 \therefore No. of dots = $2 \times 6 + 2 = 12 + 2 = 14$

When, $n = 9$

$$\therefore \text{No. of dots} = 2 \times 9 + 2 = 18 + 2 = 20$$

When, $n = 11$

$$\therefore \text{No. of dots} = 2 \times 11 + 2 = 24$$

No. of Quadrilaterals	1	2	3	4	6	9	11
No. of Dots	4	6	8	10	14	20	24

4. (a) According to the table,

formula = $5n$

When, $n = 5$

$$\therefore 5n = 5 \times 5 = 25$$

When, $n = 7$

$$\therefore 5n = 5 \times 7 = 35$$

When $n = 9$

$$\therefore 5n = 5 \times 9 = 45$$

So, the complete table

1	2	3	4	5	7	9
5	10	15	20	25	35	45

(b) According to the table

formula = $n \div 3$

When, $n = 18$

$$\therefore = 18 \div 3 = 6$$

When, $n = 21$

$$\therefore n \div 3 = 21 \div 3 = 7$$

When, $n \div 3 = 9$

$$\therefore n = 9 \times 3$$

$$n = 27$$

So, the complete table

6	9	12	15	18	21	27
2	3	4	5	6	7	9

MCQ's

1. a 2. b 3. b 4. c 5. b 6. b 7. c 8. c 9. a

NEP : Cross-Cultural Learning

- (a)

3	7	2	5
+	4	3	8

8	0	5	3
- (b)

1	7	8	8
+	2	4	3

4	2	2	0
- (c)

6	2	5	7
+	4	7	3

1	0	9	0
- (d)

3	2	4	9	4
+	9	7	3	8

1	1	9	8	7

Exercise 3.1

- True (b) False (c) False (d) True
 - False (f) False (g) False (h) True
- 23 is a prime number because it has no factors except 1 and itself.
 - 25 is a composite number because it has more than two factors.
 - 31 is a prime number.
 - 51 is a composite number.
 - 101 is a prime number.
- 36
 $1 \times 36 = 36$ So, 1 and 36 are factor of 36.
 $2 \times 18 = 36$ 2 and 18 are factor of 36.
 $3 \times 12 = 36$ 3 and 12 are factor of 36.
 $4 \times 9 = 36$ 4 and 9 are factor of 36.
 $6 \times 6 = 36$ 6 and 6 are factor of 36.
 Hence, 1, 2, 3, 4, 6, 9, 12, 18 and 36 are all the factors of 36.
 - 24
 $1 \times 24 = 24$, So, 1 and 24 are factor of 24.
 $2 \times 12 = 24$, So, 2 and 12 are factor of 24.
 $3 \times 8 = 24$, So, 3 and 8 are factor of 24.
 $4 \times 6 = 24$, So, 4 and 6 are factor of 24.
 Hence, 1, 2, 3, 4, 6, 8, 12 and 24 are all the factors of 24.
 - 18
 $1 \times 18 = 18$, So, 1 and 18 are factor of 18.
 $2 \times 9 = 18$, So, 2 and 9 are factor of 18.
 $3 \times 6 = 18$, So, 3 and 6 are factor of 18.
 Hence, 1, 2, 3, 6, 9 and 18 are all the factors of 18.
 - 28
 $1 \times 28 = 28$, So, 1 and 28 are factor of 28.
 $2 \times 14 = 28$, So, 2 and 14 are factor of 28.
 $4 \times 7 = 28$, So, 4 and 7 are factor of 28.
 Hence, 1, 2, 4, 7, 14 and 28 are all the factors of 28.
- 19
 $19 \times 1 = 19$, $19 \times 2 = 38$, $19 \times 3 = 57$,
 $19 \times 4 = 76$ $19 \times 5 = 95$
 \therefore The first five multiples of 19 are 19, 38, 57, 76 and 95.
 - 21
 $21 \times 1 = 21$, $21 \times 2 = 42$, $21 \times 3 = 63$,
 $21 \times 4 = 84$, $21 \times 5 = 105$
 \therefore The first five multiples of 21 are 21, 42, 63, 84 and 105.
 - 25
 $25 \times 1 = 25$, $25 \times 2 = 50$, $25 \times 3 = 75$,
 $25 \times 4 = 100$, $25 \times 5 = 125$
 \therefore The first five multiples of 25 are 25, 50, 75, 100 and 125.
 - 17
 $17 \times 1 = 17$ $17 \times 2 = 34$ $17 \times 3 = 51$
 $17 \times 4 = 68$ $17 \times 5 = 85$
 \therefore The first five multiples of 17 are 17, 34, 51, 68 and 85.
- 11
 $11 \times 1 = 11$, $11 \times 2 = 22$, $11 \times 3 = 33$,
 $11 \times 4 = 44$, $11 \times 5 = 55$, $11 \times 6 = 66$,
 $11 \times 7 = 77$, $11 \times 8 = 88$ $11 \times 9 = 99$
 \therefore All the multiples of 11 upto 100 are 11, 22, 33, 44, 55, 66, 77, 88 and 99.
- First 10 prime numbers are 2, 3, 5, 7, 11, 13, 17, 19, 23 and 29.
- The smallest prime number is 2. It is an even number.
- Two consecutive odd prime number are called twin primes. (3, 5); (5, 7); (11, 13); (17, 19); (29, 31); (41, 43) are all twin prime numbers between 1 and 50.
- | | |
|--------------|-------------|
| even numbers | odd numbers |
| (b) 38 | (a) 35 |
| (c) 52 | (d) 59 |
| (h) 576 | (e) 79 |
| | (f) 145 |
| | (g) 333 |
- Two numbers are known as co-primes if they have not a common factor other than 1.
for example, (2, 3); (3, 4); (4, 5); (5, 6); and (6, 7) are pairs of co-prime.
- 31
 $\Rightarrow 7 + 11 + 13 = 31$
 \therefore three odd prime numbers are 7, 11 and 13.
 - 35
 $\Rightarrow 7 + 11 + 17 = 35$
 \therefore three odd prime numbers are 7, 11 and 35.
 - 49
 $\Rightarrow 13 + 17 + 19 = 49$
 \therefore three odd prime numbers are 13, 17 and 19.
 - 63
 $\Rightarrow 13 + 19 + 31 = 63$
 \therefore three odd prime numbers are 13, 19 and 31.
- 36
 $\Rightarrow 17 + 19 = 36$
 \therefore (17, 19) are twin primes.
 - 60
 $\Rightarrow 29 + 31 = 60$
 \therefore (29, 31) are twin primes.
 - 84
 $\Rightarrow 41 + 43 = 84$
 \therefore (41, 43) are twin primes.
 - 120
 $\Rightarrow 59 + 61 = 120$
 \therefore (59, 61) are twin primes.
- 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47, 53, 59, 61, 67, 71, 73, 79, 83, 89 and 97 are prime numbers.
There are 25 prime numbers between 1 and 100.

14. 12, 24, 36, 48, 60 are multiples of both 3 and 4 less than 70.
 15. Yes, the smallest odd composite number is 9.

Mental Maths

Fill in the blanks :

- (a) 1 is neither **prime** nor **composite**.
 (b) The smallest prime number is **2**.
 (c) The smallest even prime is **2**.
 (d) The smallest composite number is **4**.
 (e) A number and its successor are always **co-primes**.

Match the items in column A with the items in column B :

- | Column A | Column B |
|----------|-------------------------------|
| (a) 2 | (ii) even prime number |
| (b) 1 | (iv) smallest odd number |
| (c) 4 | (i) smallest composite number |
| (d) 6 | (iii) perfect number |

NEP : Multiple Intelligence

Number	Divisible by			
	2	3	4	5
182	Yes	No	No	No
1685	No	No	No	Yes
6680	Yes	No	Yes	Yes
2865	No	Yes	No	Yes
3600	Yes	Yes	Yes	Yes

Exercise 3.2

1. (a) True (b) False (c) False
 (d) True (e) True
2. (a) Given number = 377316, test the divisibility by 2.
 \therefore The last digit is 6.
 Which is divisible by 2.
 So, 377316 is divisible by 2.
 (b) Given number = 537897
 \therefore The last digit is 7.
 Which is not divisible by 2.
 So, 537897 is not divisible by 2.
 (c) Given number = 789400
 \therefore The last digit is 0.
 Which is divisible by 2.
 So, 789400 is divisible by 2.
3. (a) Given number = 94650
 \therefore The last digit is 0.
 So, 94650 is divisible by 5.
 (b) Given number = 235090
 \therefore The last digit is 0.
 So, 235090 is divisible by 5.
 (c) Given number = 53378
 \therefore The last digit is 8.
 which is not divisible by 5.
 So, 53378 is not divisible by 5.
4. (a) Given number = 26570
 The number 26570 has 0 in the unit's place.
 There fore, the number 26570 is divisible by 10.
- (b) Given number = 207000
 The number 207000 has 0 in the units place.
 There fore, the number 207000 is divisible by 10.
- (c) Given number = 93640
 The number 93640 has 0 in the unit's place.
 There fore, the number 93640 is divisible by 10.
5. (a) Given number = 254784
 Test the divisibility by 3.
 Sum of the digit of 254784 = $2 + 5 + 4 + 7 + 8 + 4 = 30$,
 which is divisible by 3. ($\therefore 30 \div 3 = 10$)
 So, 254784 is divisible by 3.
- (b) Given number = 100083.
 Test the divisibility by 3.
 Sum of the digits of 100083 = $1 + 0 + 0 + 0 + 8 + 3 = 12$,
 which is divisible by 3. ($\therefore 12 \div 3 = 4$)
 So, 100083 is divisible by 3.
- (c) Given number = 20802
 Test the divisibility by 3
 Sum of the digits of 20802 = $2 + 0 + 8 + 0 + 2 = 12$
 which is divisible by 3 ($\therefore 12 \div 3 = 4$)
 So, 20802 is divisible by 3.
6. (a) We have the number $54 * 106$.
 Sum of the given digits in the number
 $= 5 + 4 + 1 + 0 + 6 = 16$
 The number next to 16 which is divisible by 3 is 18.
 So, the * is to be replaced by $(18 - 16) = 2$
 The smallest digit which replace * is 2.
 The new number which will be divisible by 3 is 542106.
- (b) We have the number $237 * 48$
 Sum of the given digits in the number
 $= 2 + 3 + 7 + 4 + 8 = 24$
 The number is 24, which is divisible by 3.
 So, the * is to be replaced by 0.
 The smallest digit which replace * is 0.
 The new number which will be divisible by 3 is 237048.
7. (a) We have the number $53 * 88$
 Sum of the given digits in the number = $5 + 3 + 8 + 8 = 24$
 The number next to 24 which is divisible by 9 is 27.
 So, the * is to be replaced by $(27 - 24) = 3$.
 The smallest digit which replace * is 3.
 The new number which will be divisible by 9 is 53388.
- (b) We have the number $667 * 48$.
 Sum of the given digits in the number
 $= 6 + 6 + 7 + 4 + 8 = 31$
 The number next to 31 which is divisible by 9 is 36.
 So, the * is to be replaced by $(36 - 31) = 5$.
 The smallest digit which replace * is 5.
 The new number which will be divisible by 9 is 667548.
8. (a) We have the number $90208 * 14$.
 Sum of the digits at odd places = $9 + 2 + 8 + 1 = 20$
 Sum of the digits at even places = $0 + 0 + * + 4 = * + 4$
 Difference of the two sums = either 0 or multiple of
 $20 - (* + 4) = \text{multiple of } 11$.
 $20 - * - 4 = 11$
 $16 - * = 11$

$$* = 16 - 11$$

$$* = 5$$

So, the * is to be replaced by 5.

The smallest digit which replace * is 5.

The new number which will be divisible by 11 is 90208514.

- (b) We have the number $8*3423$.

Sum of the digits at odd places = $8 + 3 + 2 = 13$

Sum of the digits at even places = $* + 4 + 3 = * + 7$

Difference of the two sums = 0 or multiple of 11

$$13 - (* + 7) = 0$$

$$13 - * - 7 = 0$$

$$* = 13 - 7$$

$$* = 6$$

So, the * is to be replaced by 6.

The smallest digit which replace * is 6.

The new number which will be divisible by 11 is 863423.

9. (a) We have number 96525.

Test the divisibility by 9

Sum of the digits of 96525 = $9 + 6 + 5 + 2 + 5 = 27$,

Which is divisible by 9.

So, 96525 is divisible by 9.

- (b) We have number 297351.

Test the divisibility by 9.

Sum of the digits of 297351 = $2 + 9 + 7 + 3 + 5 + 1 = 27$,

Which is divisible by 9.

So, 297351 is divisible by 9.

- (c) We have number 835686.

Test the divisibility by 9.

Sum of the digits of 835686 = $8 + 3 + 5 + 6 + 8 + 6 = 36$,
which is divisible by 9.

So, 835686 is divisible by 9.

10. (a) We have number 55770.

The last digit of the number is 0, so it is divisible by 2.

Sum of the digits of 55770 = $5 + 5 + 7 + 7 + 0 = 24$,
which is divisible by 3.

So, it is also divisible by 3.

Since, 55770 is divisible by both 2 and 3.

So, 55770 is divisible by 6.

- (b) We have the number 42174.

Test the divisibility by 6.

The last digit of the number is 4, so it is divisible by 2.

Sum of the digits of 42174 = $4 + 2 + 1 + 7 + 4 = 18$,
which is divisible by 3.

So, it is also divisible by 3.

Since, 42174 is divisible by both 2 and 3.

So, 42174 is divisible by 6.

- (c) We have the number 33675.

Test the divisibility by 6.

The last digit of the number is 5, so it is not divisible by 2.

So, 33675 is not divisible by 6.

11. (a) Given number = 6216.

Test the divisibility by 4.

The number formed by its last two digits is 16,
which is divisible by 4.

Therefore, 6216 is divisible by 4.

- (b) Given number = 3214

Test the divisibility by 4.

The number formed by its last two digits is 14,
which is not divisible by 4.

Therefore, 3214 is not divisible by 4.

- (c) Given number = 63720

Test the divisibility by 4 its last two digits is 20,
which is divisible by 4.

Therefore, 63720 is divisible by 4.

12. (a) Given number = 39864.

Test the divisibility by 8.

In 39864, the number formed by the hundreds, ten's and
unit's digit is 864, which is divisible by 8.

So, 39864 is divisible by 8.

- (b) Given number = 123808.

Test the divisibility by 8.

In 123808, the number formed by the hundreds, ten's
and unit's digits is 808, which is divisible by 8.

So, 123808 is divisible by 8.

- (c) Given number = 63791

Test the divisibility by 8.

In 63791, the number formed by the hundreds, ten's and
unit's digits is 791, which is not divisible by 8.

So, 63791 is not divisible by 8.

13. (a) Given number = 446321.

Test the divisibility by 11.

In 446321, sum of the digits at odd places

$$= 4 + 6 + 2 = 12$$

Sum of the digits at even places = $4 + 3 + 1 = 8$.

Difference of the two sums = $12 - 8 = 4$,
which is not a multiple of 11.

So, 446321 is not divisible by 11.

- (b) Given number = 57834.

Test the divisibility by 11.

In 57834, sum of the digits at odd places = $5 + 8 + 4 = 17$.

Sum of the digits at even places = $7 + 3 = 10$.

Difference of the two sums = $17 - 10 = 7$,
which is not a multiple of 11.

So, 57834 is not divisible by 11.

- (c) Given number = 901351.

Test the divisibility by 11.

In 901351, sum of the digits at odd places

$$= 9 + 1 + 5 = 15.$$

Sum of the digits at even places = $0 + 3 + 1 = 4$

Difference of the two sums = $15 - 4 = 11$.

Which is a multiple of 11.

So, 901351 is divisible by 11.

- (d) Given number = 68353.

Test the divisibility by 11.

In 68353, sum of the digits at odd places = $6 + 3 + 3 = 12$.

Sum of the digits at even places = $8 + 5 = 13$

Difference of the two sums = $13 - 12 = 1$, which is not a
multiple of 11.

So, 68353 is not divisible by 11.

- (e) Given number = 95325

Test the divisibility by 11.

In 95325, sum of the digits at odd places = $9 + 3 + 5 = 17$.
 Sum of the digits at even places = $5 + 2 = 7$
 Difference of the two sums = $17 - 7 = 10$, which is not a multiple of 11.

So, 95325 is not divisible by 11.

- (f) Given number = 45694

Test the divisibility by 11.

In 45694 sum of the digits at odd places = $4 + 6 + 4 = 14$

Sum of the digits at even places = $5 + 9 = 14$.

Difference of the sums = $14 - 14 = 0$, which is divisible by 11.

So, 45694 is divisible by 11.

14. (a) Given number = 167

$$\because 167 < 13^2$$

Test the divisibility of 167 by each one of the prime numbers 2, 3, 5, 7, 11 and 13.

We find that 167 is not divisible by any of them.

So, 167 is a prime number.

- (b) Given number = 179

$$\because 179 < 14^2$$

Test the divisibility of 179 by each one of the prime numbers 2, 3, 5, 7, 11 and 13.

We find that 179 is not divisible by any of them.

So, 179 is a prime number.

- (c) Given number = 267.

$$\because 267 < 17^2$$

Test the divisibility of 267 by each one of the prime numbers 2, 3, 5, 7, 11, 13 and 17.

We find that 267 is divisible by 3.

So, 267 is not a prime number.

- (d) Given number = 353.

$$\because 353 < 19^2$$

Test the divisibility of 353 by each one of the prime numbers 2, 3, 5, 7, 11, 13, 17 and 19.

We find that 353 is not divisible by any of these numbers.

So, 353 is a prime number.

Exercise 3.3

1. (a) 4335

By the prime factorisation :

3	4335
5	1445
17	289
17	17
	1

Hence, $4335 = 3 \times 5 \times 17 \times 17$.

- (b) 9282

By the prime factorisation :

2	9282
3	4641
7	1547
13	221
17	17
	1

Hence, $9282 = 2 \times 3 \times 7 \times 13 \times 17$.

- (c) 2907

By the prime factorisation :

3	2907
3	969
17	323
19	19
	1

Hence, $2907 = 3 \times 3 \times 17 \times 19$.

2. Take first four prime numbers are 2, 3, 5 and 7.

So, the smallest number = $2 \times 3 \times 5 \times 7$

$$= 30 \times 7$$

$$= 210$$

3. The smallest number of 4-digit = 1000

By the prime factorisation :

2	1000
2	500
2	250
5	125
5	25
5	5
	1

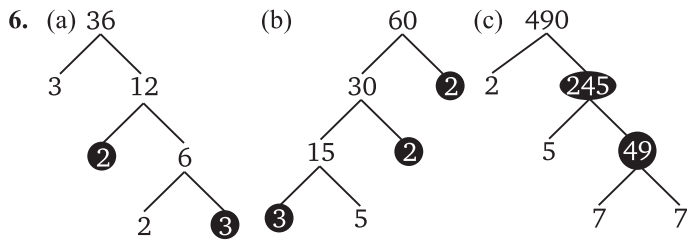
Hence, $1000 = 2 \times 2 \times 2 \times 5 \times 5 \times 5 = 2^3 \times 5^3$

5. The greatest number of 6-digit = 999999

By the prime factorisation :

3	999999
3	333333
3	111111
7	37037
11	5291
13	481
37	37
	1

Hence, $999999 = 3 \times 3 \times 3 \times 7 \times 11 \times 13 \times 37$



Mental Maths

(a) True; (b) False; (c) True; (d) False; (e) False

Exercise 3.4

1. (a) 36, 84

Prime factors of 36,

$$\therefore 36 = 2 \times 2 \times 3 \times 3$$

And, prime factors of 84

$$\therefore 84 = 2 \times 2 \times 3 \times 7$$

Product of common prime factors

$$= 2 \times 2 \times 3 = 12$$

Hence, the HCF of 36 and 84 is 12.

(b) 14, 42, 84

Prime factors of 14,

$$\therefore 14 = 2 \times 7$$

Prime factors of 42

$$\therefore 42 = 2 \times 3 \times 7$$

And

Prime factors of 84

$$\therefore 84 = 2 \times 2 \times 3 \times 7$$

Product of common prime factors = $2 \times 7 = 14$

Hence, the H.C.F. of 14, 42 and 84 is 14.

(c) 140, 252, 630

Prime factors of 140

$$\therefore 140 = 2 \times 2 \times 5 \times 7$$

Prime factors of 252

$$\therefore 252 = 2 \times 2 \times 3 \times 3 \times 7$$

And Prime factors of 630

$$\therefore 630 = 2 \times 3 \times 3 \times 5 \times 7$$

Product of common prime factors = $2 \times 7 = 14$

Hence, the H.C.F. of 140, 252 and 630 is 14.

2	36
2	18
3	9
3	3
	1

2	84
2	42
3	21
7	7
	1

2	14
7	7
	1

2	42
3	21
7	7
	1

2	84
2	42
3	21
7	7
	1

2	140
2	70
5	35
7	7
	1

2	252
2	126
3	63
3	21
7	7
	1

2	630
3	315
3	105
5	35
7	7
	1

2. (a) 504, 980

By long division method :

$$\begin{array}{r}
 504 \overline{)980} (1 \\
 \underline{-504} \\
 476 \overline{)504} (1 \\
 \underline{-476} \\
 28 \overline{)476} (17 \\
 \underline{-28} \\
 196 \\
 \underline{-196} \\
 \times
 \end{array}$$

Hence, the H.C.F. of 504 and 980 is 28.

(b) 155, 341, 1302

By long division method

$$\begin{array}{r}
 155 \overline{)341} (2 \\
 \underline{-310} \\
 31 \overline{)155} (5 \\
 \underline{-155} \\
 0
 \end{array}$$

So, the H.C.F. of 155 and 341 is 31.

Now, find the H.C.F. of 31 and 1302.

$$\begin{array}{r}
 31 \overline{)1302} (42 \\
 \underline{-124} \\
 62 \\
 \underline{-62} \\
 0
 \end{array}$$

Hence, the final H.C.F. of 155, 341 and 1302 is 31.

(c) 1197, 5320, 4389

By long division method

$$\begin{array}{r}
 1197 \overline{)5320} (4 \\
 \underline{-4788} \\
 532 \overline{)1197} (2 \\
 \underline{-1064} \\
 133 \overline{)532} (4 \\
 \underline{-532} \\
 0
 \end{array}$$

So, the H.C.F. of 1197 and 5320 is 133.

Now, find the HCF of 133 and 4389 is :

$$\begin{array}{r}
 133 \overline{)4389} (33 \\
 \underline{-399} \\
 399 \\
 \underline{-399} \\
 0
 \end{array}$$

Hence the final H.C.F. of 1197, 5320 and 4389 is 133.

3. (a) 847, 1014

By prime factorization method :

$$847 = 7 \times 11 \times 11$$

7	847
11	121
11	11
	1

And $1014 = 1 \times 2 \times 3 \times 13 \times 13$
 \therefore Common factor = 1
Hence, 847 and 1017 are co-prime.

2	1014
3	507
13	169
13	13
	1

(b) 343, 432
By prime factorization method :
 $343 = 1 \times 7 \times 7 \times 7$

7	343
7	49
7	7
	1

$432 = 1 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 3$
 \therefore Common factor = 1
Hence, 343 and 432 are co-prime.

2	432
2	216
2	108
2	54
3	27
3	9
3	3
	1

(c) 59, 97
By prime factorization method.
 $59 = 1 \times 59$
 $97 = 1 \times 97$
 \therefore Common factor = 1
Hence, 59 and 97 are co-primes.

59	59
	1

97	97
	1

4. (a) $\frac{1794}{2346}$

In order to reduce a given fraction to the lowest terms, we divide its numerator and denominator by their H.C.F.

Now, we find the H.C.F. of 1794 and 2346.

1794	2346	(1
- 1794		
552	1794	(3
- 1656		
138	552	(4
- 552		
		\times

Hence, the HCF of 1794 and 2346 is 138.

Now, dividing the numerator and the denominator by 138

$$\frac{1794}{2346} = \frac{1794 \div 138}{2346 \div 138} = \frac{13}{17}$$

Hence, the lowest term of $\frac{1794}{2346}$ is $\frac{13}{17}$.

(b) $\frac{296}{480}$
We find the H.C.F. of 296 and 480.

296	480	(1
- 296		
184	296	(1
- 184		
112	184	(1
- 112		
72	112	(1
- 72		
40	72	(1
- 40		
32	40	(1
- 32		
8	32	(4
- 32		
		$0 \times$

Hence, the H.C.F. of 296 and 480 is 8.

Now, dividing the numerator and the denominator by 8.

$$\frac{296}{480} = \frac{296 \div 8}{480 \div 8} = \frac{37}{60}$$

Hence, the lowest term of $\frac{296}{480}$ is $\frac{37}{60}$.

(c) $\frac{161}{207}$

we find the H.C.F. of 161 and 207.

161	207	(1
- 161		
46	161	(3
- 138		
23	46	(2
- 46		
		\times

Hence, the HCF of 161 and 207 is 23.

Now, dividing the numerator and denominator by 23.

$$\frac{161}{207} = \frac{161 \div 23}{207 \div 23} = \frac{7}{9}$$

Hence, the lowest term of $\frac{161}{207}$ is $\frac{7}{9}$.

5. Clearly, we must find the greatest number which divides $(1277-3)$ and $(1368-3)$ exactly.

1274	1365	(1
- 1274		
91	1274	(14
- 91		
364		
- 364		
		\times

So, the required number = H.C.F. of 1274 and 1365 = 91

Hence, the required greatest number is 91.

6. Clearly, we must find the greatest number which divides (445-4), (572-5) and (699-6) exactly.

$$\begin{array}{r} 441 \overline{)567} (1 \\ -441 \\ \hline 126 \end{array} \begin{array}{r} 441 \overline{)3} \\ -441 \\ \hline 63 \end{array} \begin{array}{r} 126 \overline{)2} \\ -126 \\ \hline \times \end{array}$$

And the H.C.F. of 63 and 693 is 63.

$$\begin{array}{r} 63 \overline{)693} (11 \\ -63 \\ \hline 63 \\ -63 \\ \hline \times \end{array}$$

So, the required number = H.C.F. of 441, 567 and 693 = 63

Hence, the required greatest number is 63.

7. Clearly, we must find the greatest number which divides (398-7), (436-11) and (452-10) exactly.

$$\begin{array}{r} 391 \overline{)425} (1 \\ -391 \\ \hline 34 \end{array} \begin{array}{r} 391 \overline{)11} \\ -34 \\ \hline 51 \\ -34 \\ \hline 17 \end{array} \begin{array}{r} 34 \overline{)2} \\ -34 \\ \hline \times \end{array}$$

And the H.C.F. of 17 and 442 is 17.

$$\begin{array}{r} 17 \overline{)442} (26 \\ -34 \\ \hline 102 \\ -102 \\ \hline \times \end{array}$$

So, the required number = H.C.F. of 391, 425 and 442 = 17

Hence, the required greatest number is 17.

8. Length of first tape = 7 m or = 700 cm
Length of second tape = 3 m 85 cm = 385 cm
And length of third tape = 12 m 95 cm = 1295 cm
Longest length of each tape will be the H.C.F. of 700 cm, 385 cm and 1295 cm.

$$\begin{array}{r} 385 \overline{)700} (1 \\ -385 \\ \hline 315 \end{array} \begin{array}{r} 385 \overline{)1} \\ -385 \\ \hline 315 \end{array} \begin{array}{r} 315 \overline{)4} \\ -315 \\ \hline 70 \end{array} \begin{array}{r} 315 \overline{)2} \\ -70 \\ \hline \times \end{array}$$

And the H.C.F. of 35 cm and 1295 cm is :

$$\begin{array}{r} 35 \overline{)1295} (37 \\ -105 \\ \hline 245 \\ -245 \\ \hline \times \end{array}$$

H.C.F. of 700 cm, 385 cm and 1295 cm is 35 cm.

So, the longest tape is 35 cm.

Hence, the require measure of tape is 35 cm.

9. The capacity of two tankes 700 L and 750 L respectively.

The maximum capacity of container

= H.C.F. of the capacity of both the tankers

= H.C.F. of 700 L and 750 L

$$\begin{array}{r} 700 \overline{)750} (1 \\ -700 \\ \hline 50 \end{array} \begin{array}{r} 700 \overline{)14} \\ -50 \\ \hline 200 \\ -200 \\ \hline \times \end{array}$$

∴ H.C.F. of 700 L and 750 L = 50 L

Hence, the maximum capacity of the required container is 50 L.

10. We first find the H.C.F. of 490 kg, 588 kg and 882 kg.

$$\begin{array}{r} 490 \overline{)588} (1 \\ -490 \\ \hline 98 \end{array} \begin{array}{r} 490 \overline{)5} \\ -490 \\ \hline 0 \end{array}$$

∴ H.C.F. of 490 kg and 588 kg is 98 kg.

Now, we find the H.C.F. of 98 kg and 882 kg.

$$\begin{array}{r} 98 \overline{)882} (9 \\ -882 \\ \hline 0 \end{array}$$

∴ H.C.F. of 490, 588 and 822 is 98 kg.

∴ Hence, the maximum capacity of wheat can be packed in a bag is 98 kg.

11. Length of the courtyard = 18 m 72 cm = 1872 cm.
Breadth of the courtyard = 13 m 20 cm = 1320 cm.
Largest size of each tile will be the H.C.F. of 1872 cm and 1320 cm.
H.C.F. of 1872 cm and 1320 cm is 24 cm.
So, the largest size of the square tiles is 24 cm.

$$\begin{array}{r} 1320 \overline{)1872} (1 \\ -1320 \\ \hline 552 \end{array} \begin{array}{r} 1320 \overline{)2} \\ -1104 \\ \hline 216 \end{array} \begin{array}{r} 552 \overline{)2} \\ -432 \\ \hline 120 \end{array} \begin{array}{r} 552 \overline{)1} \\ -120 \\ \hline \times \end{array}$$

$$\begin{array}{r} 96 \overline{)120} (1 \\ - 96 \\ \hline 24 \overline{)96} (4 \\ - 96 \\ \hline \times \end{array}$$

Least number of square tiles.

$$\begin{aligned} &= \frac{\text{Area of rectangular courtyard}}{\text{Area of a tile}} \\ &= \frac{1872 \times 1320}{24 \times 24} = 78 \times 55 = 4290 \text{ tiles} \end{aligned}$$

Hence, the least number of required tiles is 4290.

12. Length of the room = 8 m 25 cm = 825 cm
Breadth of the room = 6 m 75 cm = 675 cm
Height of the room = 4 m 50 cm = 450 cm
The length of the room = H.C.F. of 825 cm, 675 cm and 450 cm.
We first find the H.C.F. of 825 cm and 675 cm.

$$\begin{array}{r} 675 \overline{)825} (1 \\ - 675 \\ \hline 150 \overline{)675} (4 \\ - 600 \\ \hline 75 \overline{)150} (2 \\ - 150 \\ \hline \times \end{array}$$

Now, find the H.C.F. of 75 cm and 450 cm.

$$\begin{array}{r} 75 \overline{)450} (6 \\ - 450 \\ \hline 0 \end{array}$$

\therefore The H.C.F. of 825 cm, 675 cm and 450 cm is 75 cm.
Hence, the length of the required longest tape is 75 cm.

Exercise 3.5

1. (a) 12, 48

We have,

2	12
2	6
3	3
	1

2	48
2	24
2	12
2	6
3	3
	1

$$\begin{aligned} \therefore 12 &= 2 \times 2 \times 3 = 2^2 \times 3 \\ 48 &= 2 \times 2 \times 2 \times 2 \times 3 = 2^4 \times 3 \\ \text{L.C.M. of 12 and 48} &= 2 \times 2 \times 2 \times 2 \times 3 \\ &= 2^4 \times 3 = 16 \times 3 = 48 \end{aligned}$$

Hence, the L.C.M. of 12 and 48 is 48.

- (b) 9, 45

We have

3	9
3	3
	1

3	45
3	15
5	5
	1

$$\begin{aligned} \therefore 9 &= 3 \times 3 = 3^2 \text{ and } 45 = 3 \times 3 \times 5 = 3^2 \times 5 \\ \text{L.C.M. of 9 and 45} &= 3^2 \times 5 = 9 \times 5 = 45 \end{aligned}$$

Hence, the L.C.M. of 9 and 45 is 45.

- (c) 24, 36

We have

2	24
2	12
2	6
3	3
	1

2	36
2	18
3	9
3	3
	1

$$\begin{aligned} \therefore 24 &= 2 \times 2 \times 2 \times 3 = 2^3 \times 3 \\ \text{and } 36 &= 2 \times 2 \times 3 \times 3 = 2^2 \times 3^2 \end{aligned}$$

L.C.M. of 24 and 36 = $2 \times 2 \times 2 \times 3 \times 3 = 72$
Hence, the L.C.M. of 24 and 36 is 72.

- (d) 40, 48, 45

We have

2	40
2	20
2	10
5	5
	1

2	48
2	24
2	12
2	6
3	3
	1

3	45
3	15
5	5
	1

$$\begin{aligned} \therefore 40 &= 2 \times 2 \times 2 \times 5 = 2^3 \times 5 \\ 48 &= 2 \times 2 \times 2 \times 2 \times 3 = 2^4 \times 3 \\ 45 &= 3 \times 3 \times 5 = 3^2 \times 5 \end{aligned}$$

L.C.M. of 40, 48 and 45 = $2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 5 = 720$
Hence, the L.C.M. of 40, 48 and 45 is 720.

- (e) 16, 28, 40

We have

2	16
2	8
2	4
2	2
	1

2	28
2	14
7	7
	1

2	40
2	20
2	10
5	5
	1

$$\begin{aligned} \therefore 16 &= 2 \times 2 \times 2 \times 2 = 2^4 \\ 28 &= 2 \times 2 \times 7 = 2^2 \times 7 \\ 40 &= 2 \times 2 \times 2 \times 5 = 2^3 \times 5 \\ \text{L.C.M. of 16, 28 and 40} &= 2 \times 2 \times 2 \times 2 \times 5 \times 7 \\ &= 16 \times 35 \\ &= 560 \end{aligned}$$

(f) 64, 72, 96

We have

2	64
2	32
2	16
2	8
2	4
2	2
	1

2	72
2	36
2	18
3	9
3	3
	1

2	96
2	48
2	24
2	12
2	6
3	3
	1

$$\therefore 64 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 = 2^6$$

$$72 = 2 \times 2 \times 2 \times 3 \times 3 = 2^3 \times 3^2$$

$$96 = 2 \times 2 \times 2 \times 2 \times 2 \times 3 = 2^5 \times 3$$

L.C.M. of 64, 72 and 96

$$= 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 = 576$$

2. (a)

3	117, 221
3	39, 221
13	13, 221
17	1, 17
	1, 1

$$\text{L.C.M. of 117 and 221} = 3 \times 3 \times 13 \times 17$$

$$= 1989$$

Hence, the L.C.M. of the given numbers is 1989.

(b)

2	234, 572
2	117, 286
3	117, 143
3	39, 143
13	13, 143
11	1, 11
	1, 1

$$\text{L.C.M. of 234 and 572} = 2 \times 2 \times 3 \times 3 \times 13 \times 11 = 5148$$

Hence, the L.C.M. of the given numbers is 5148.

(c)

2	27, 90
3	27, 45
3	9, 15
3	3, 5
5	1, 5
	1, 1

$$\text{L.C.M. of 27 and 90} = 2 \times 3 \times 3 \times 3 \times 5 = 270$$

Hence, the L.C.M. of the given numbers is 270.

(d)

2	8, 12, 16, 30
2	4, 6, 8, 15
2	2, 3, 4, 15
2	1, 3, 2, 15
3	1, 3, 1, 15
5	1, 1, 1, 5
	1, 1, 1, 1

$$\text{L.C.M. of 8, 12, 16 and 30} = 2 \times 2 \times 2 \times 2 \times 3 \times 5 = 240$$

Hence, the L.C.M. of the given numbers is 240.

(e)

2	144, 180, 384
2	72, 90, 192
2	36, 45, 96
2	18, 45, 48
2	9, 45, 24
2	9, 45, 12
2	9, 45, 6
3	9, 45, 3
3	3, 15, 1
5	1, 5, 1
	1, 1, 1

$$\text{L.C.M. of 144, 180 and 384}$$

$$= 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 5$$

$$= 5760$$

Hence, the LCM of the given numbers is 5760.

3. (a) We first find the H.C.F. of 576, 720 and after then L.C.M.

$$\begin{array}{r} 576 \overline{)720} \quad 1 \\ - 576 \\ \hline 144 \overline{)576} \quad 4 \\ - 576 \\ \hline 0 \end{array}$$

The H.C.F. of 576 and 720 is 144.

2	576, 720
2	288, 360
2	144, 180
2	72, 90
2	36, 45
2	18, 45
3	9, 45
3	3, 5
5	1, 15
	1, 1

The L.C.M. of 576 and 720
 $= 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 5 = 2880$

Hence, the H.C.F. and L.C.M. of the given numbers are 144 and 2880 respectively.

- (b) We first find the H.C.F. of 1152, 1664 and after then L.C.M.

$$\begin{array}{r} 1152 \overline{)1664} (1 \\ \underline{-1152} \\ 512 \end{array} \begin{array}{l} 1152 (2 \\ \underline{-1024} \\ 128 \end{array} \begin{array}{l} 512 (4 \\ \underline{-512} \\ \times \end{array}$$

The H.C.F. of 1152 and 1664 is 128.

2	1152, 1664
2	576, 832
2	288, 416
2	144, 208
2	72, 104
2	36, 52
2	18, 26
3	9, 13
3	3, 13
13	1, 13
	1, 1

The LCM of 1152 and 1664
 $= 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 13$
 $= 14,976$

Hence, the H.C.F. and L.C.M. of the given numbers are 128 and 14976 respectively.

- (c) We first find the H.C.F. of 234, 572 and after then L.C.M.

$$\begin{array}{r} 234 \overline{)572} (2 \\ \underline{-468} \\ 104 \end{array} \begin{array}{l} 234 (2 \\ \underline{-208} \\ 26 \end{array} \begin{array}{l} 104 (4 \\ \underline{-104} \\ \times \end{array}$$

The H.C.F. of 234 and 572 is 26.

2	234, 572
2	117, 286
3	117, 143
3	39, 143
11	13, 143
13	13, 13
	1, 1

The L.C.M. of 234 and 572
 $= 2 \times 2 \times 3 \times 3 \times 11 \times 13$
 $= 5148$

Hence, the H.C.F. and L.C.M. of given numbers are 26 and 5148 respectively.

4. We know that, H.C.F. is one of the factors of L.C.M.
 So, 16 should be a factor of 380.
 But 16 is not a factor of 380.
 So, there can not exist two numbers such that they have 16 as their H.C.F. and 230 as their L.C.M.

5. The given,

$$\text{H.C.F.} = 16$$

$$\text{The product of two numbers} = 3072$$

$$\text{L.C.M.} = ?$$

We know that,

$$\text{H.C.F.} \times \text{L.C.M.} = \text{product of two numbers}$$

$$16 \times \text{L.C.M.} = 3072$$

$$\text{L.C.M.} = \frac{3072}{16}$$

$$= 192$$

Hence, the L.C.M. is 192.

6. The given,

$$\text{H.C.F.} = ?$$

$$\text{The product of two numbers} = 128$$

$$\text{L.C.M.} = 32$$

$$\therefore \text{H.C.F.} \times \text{L.C.M.} = \text{product of two numbers}$$

$$\text{H.C.F.} \times 32 = 128$$

$$\text{H.C.F.} = \frac{128}{32} = 4$$

Hence, the H.C.F. is 4.

7. The given

$$\text{H.C.F.} = 145,$$

$$\text{L.C.M.} = 2175$$

$$\text{One of the number} = 725$$

$$\text{The other number} = ?$$

$$\therefore \text{H.C.F.} \times \text{L.C.M.} = \text{One number} \times \text{Other number}$$

$$145 \times 2175 = 725 \times \text{Other number}$$

$$\text{Other number} = \frac{145 \times 2175}{725}$$

$$= 145 \times 3$$

$$= 435$$

Hence, the other number is 435.

8. We first find the L.C.M. of 5, 10, 15, 20 and 25.

2	5, 10, 15, 20, 25
2	5, 5, 15, 10, 25
3	5, 5, 15, 5, 25
5	5, 5, 5, 5, 25
5	1, 1, 1, 1, 5
	1, 1, 1, 1, 1

$$\therefore \text{L.C.M.} = 2 \times 2 \times 3 \times 5 \times 5 = 300$$

Now, greatest numbers of 5-digits = 99999

$$\begin{array}{r} 300 \overline{)99999} \\ - 900 \\ \hline 999 \\ - 900 \\ \hline 999 \\ - 900 \\ \hline 99 \end{array}$$

We find that when 99999 is divided by 300, the remainder is 99.

So, the greatest number of five digit exactly divisible by 5, 10, 15, 20 and 25 = $99999 - 99 = 99900$

Hence, the required number is 99900.

9. We first find the L.C.M. of 4, 12, 20 and 24.

2	4, 12, 20, 24
2	2, 6, 10, 12
2	1, 3, 5, 6
3	1, 3, 5, 3
5	1, 1, 5, 1
	1, 1, 1, 1

\therefore L.C.M. of 4, 12, 20 and 24 = $2 \times 2 \times 2 \times 3 \times 5 = 120$

The least number of five digit number = 10000

$$\begin{array}{r} \therefore \quad 120 \overline{)10000} \\ - 960 \\ \hline 400 \\ - 360 \\ \hline 40 \end{array}$$

\therefore The smallest number of five digits exactly divisible by given numbers.

$$\begin{aligned} &= 10000 + 120 - 40 \\ &= 9960 + 120 \\ &= 10080 \end{aligned}$$

Hence, the required number of five digit is

$$= 10080 + 3 = 10083.$$

10. We first find the L.C.M. of 16, 24, 40.

2	16, 24, 40
2	8, 12, 20
2	4, 6, 10
2	2, 3, 5
3	1, 3, 5
5	1, 1, 5
	1, 1, 1

\therefore L.C.M. of 16, 24 and 40 = $2 \times 2 \times 2 \times 2 \times 3 \times 5 = 240$

Here, 240 is the least number which when divided by 16, 24, 40 and leaves a remainder 10 in each case.

Hence, the required smallest number = $240 + 8 = 248$.

11. We first find the L.C.M. of 2, 3, 4, 5, 6 and 7.

2	2, 3, 4, 5, 6, 7
2	1, 3, 2, 5, 3, 7
3	1, 3, 1, 5, 3, 7
5	1, 1, 1, 5, 1, 7
7	1, 1, 1, 1, 1, 7
	1, 1, 1, 1, 1, 1

\therefore L.C.M. of 2, 3, 4, 5, 6 and 7 = $2 \times 2 \times 3 \times 5 \times 7 = 420$

$$\begin{array}{r} \therefore \quad 420 \overline{)10000} \\ - 840 \\ \hline 1600 \\ - 1260 \\ \hline 340 \end{array}$$

\therefore The number 10000 exactly divisible by given numbers = $10000 - 340 = 9660$

And other number = $9660 + 420 = 10080$

Hence, the required two numbers are 9660 and 10080.

12. The minimum distance = L.C.M. of 80 cm, 85 cm and 90 cm.

2	80, 85, 90
2	40, 85, 45
2	20, 85, 45
2	10, 85, 45
3	5, 85, 45
3	5, 85, 15
5	5, 85, 5
17	1, 17, 1
	1, 1, 1

\therefore L.C.M. of 80 cm, 85 cm and 90

$$\begin{aligned} &= 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 5 \times 17 \\ &= 12240 \text{ cm.} \end{aligned}$$

Hence, the required minimum distance is 12240 cm or 122.40 m.

13. The bell ring together = L.C.M. of 6, 8 and 20 min.

2	6, 8, 20
2	3, 4, 10
2	3, 2, 5
3	3, 1, 5
5	1, 1, 5
	1, 1, 1

\therefore L.C.M. of 6, 8 and 20 = $2 \times 2 \times 2 \times 3 \times 5 = 120 \text{ min} = 1 \text{ hour}$

Hence, the bell will ring together again at 10 am.

14. The clocks chime together
= L.C.M. of 15 min, 20 min and 30 min

2	15, 20, 30
2	15, 10, 15
5	15, 5, 15
3	3, 1, 3
	1, 1, 1

$$\begin{aligned}\therefore \text{L.C.M. of 15, 20 and 30} &= 2 \times 2 \times 3 \times 5 \\ &= 60 \text{ min} \\ &= 1 \text{ hour}\end{aligned}$$

Hence, the clock will chime together again at 9 am.

MCQ's

1. a 2. a 3. b 4. c 5. a 6. c 7. a 8. a

Chapter

4

Integers

Mental Maths

- (a) $5 < 8$ (b) $-1 < 0$ (c) $0 > -6$ (d) $7 > -7$
 (e) $-20 < 4$ (f) $-15 > -16$
 (g) $-40 > -50$ (h) $-105 > -200$
 (i) $-3000 > -4125$ (j) $-416 > -417$

Exercise 4.1

- (a) Earning of ₹ 5000 = + ₹ 5000
 (b) Decrease in rainfall by 10 mm = - 10 mm
 (c) 45 km North = + 45 km
 (d) Going 1 km towards the West = - 1 km
 (e) 4°C below the freezing point = - 4°C
 (f) Going 300 m below the ground level into a mine = - 300 m
 (g) An aeroplane flying at a height of 1800 m above the sea level = + 1800 m.
 (h) A submarine moving at a depth of 500 m below the sea level = - 500 m.
- (a) The opposite of - 234 is + 234
 (b) The opposite of 2085 is - 2085
 (c) The opposite - 4096 is + 4096
- (a) The integers lying between 0 and 8 = 1, 2, 3, 4, 5, 6, 7.
 (b) The integers lying between 0 and - 8
 = - 1, - 2, - 3, - 4, - 5, - 6, - 7.
 (c) The integers lying between - 4 and 4
 = - 3, - 2, - 1, 0, 1, 2, 3.
 (d) The integers lying between - 10 and - 19
 = - 11, - 12, - 13, - 14, - 15, - 16, - 17, - 18.
 (e) The integers lying between - 111 and - 115
 = - 112, - 113, - 114.
- (a) Greater than - 22 = - 21, - 20, - 19, - 18, - 17.
 (b) Greater than - 96 = - 95, - 94, - 93, - 92, - 91.

HOTS

A boy saves money daily = ₹ 4.65

∴ ₹ 1 = 100 paise

∴ ₹ 4.65 = 4.65 × 100 p

To get exact number of rupees,
we will find the LCM of 100 and 465.

Now, LCM of 100 and 465
 $= 2 \times 2 \times 3 \times 5 \times 5 \times 31$
 $= 9300$

Hence, the required number of days

$$= \frac{9300}{465} = 20$$


So, he will save ₹ 93 in 20 days.

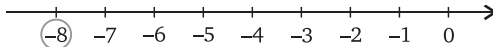
2	100, 465
2	50, 465
3	25, 465
5	25, 155
5	5, 31
31	1, 31
	1, 1

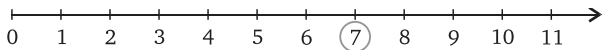
(c) Less than - 32 = - 33, - 34, - 35, - 36, - 37.

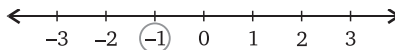
(d) Less than - 70 = - 71, - 72, - 73, - 74, - 75.

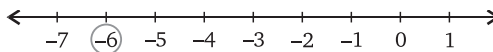
5. The greatest negative integer is - 1 and greatest positive integer is not definite.

6. (a) 

- (b) 

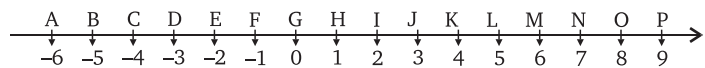
- (c) 

- (d) 

- (e) 

7. (a) Ascending order = - 10, - 9, - 7, - 5, 0, 3, 5.
 (b) Ascending order = - 84, - 48, - 45, - 33, - 30
 8. (a) Descending order = 9, 4, 0, - 4, - 6, - 9
 (b) Descending order = - 1, - 7, - 15, - 18, - 20
 9. (a) 3°C is warmer than - 1°C.
 (b) - 6°C is cooler than - 4°C.
 (c) - 8°C is lower than - 5°C.

10.

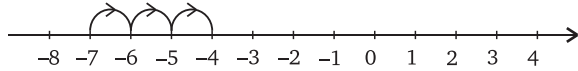


11. (a) - 8, - 6, - 4, - 2, 0, 2.
 (b) - 40, - 35, - 30, - 25, - 20, - 15
 (c) - 21, - 18, - 15, - 12, - 9, - 6
 (d) 16, 13, 10, 7, 4, 1
 (e) - 66, - 60, - 54, - 48, - 42, - 36
 (f) - 84, - 72, - 60, - 48, - 36, - 24
 (g) - 48, - 44, - 40, - 36, - 32, - 28

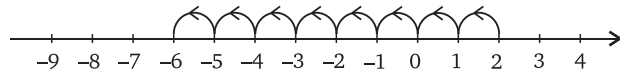
12. (a) 4 more than $5 = 5 + 4 = 9$



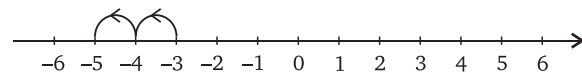
- (b) 3 more than $7 = -7 + 3 = -4$



- (c) 8 less than $2 = 2 - 8 = -6$

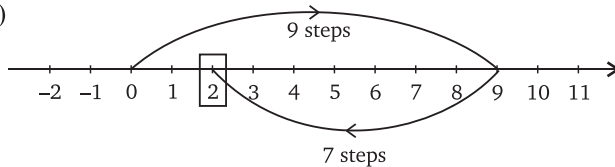


- (d) 2 less than $-3 = -3 - 2 = -5$



Exercise 4.2

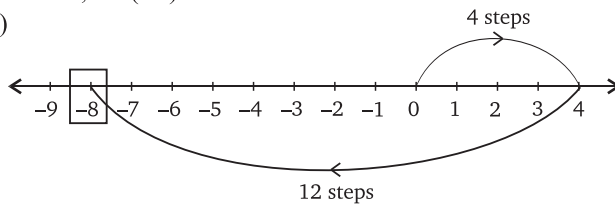
1. (a)



As shown in the above figure, you start from 0 and first move 9 steps to the right reaching 9. Then you move 7 steps to the left of 9 and reach 2.

Thus, $9 + (-7) = 2$

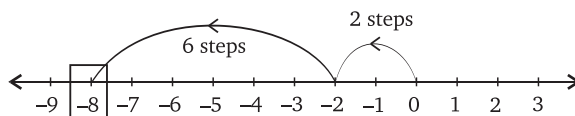
- (b)



As shown in the above figure, you start from 0 and first move 4 steps to the right reaching 4. Then you move 12 steps to the left of 4 and reach -8.

Thus, $4 + (-12) = -8$

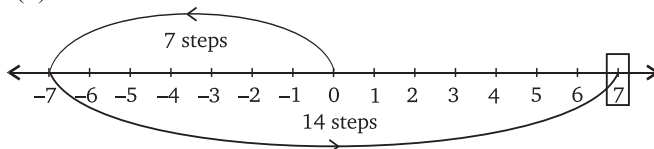
- (c)



As shown in the above figure, you start from 0 and first move 2 steps to the left reaching -2. Then you move 6 steps again to the left starting from -2. You reach at -8.

Thus, $(-2) + (-6) = -8$

- (d)

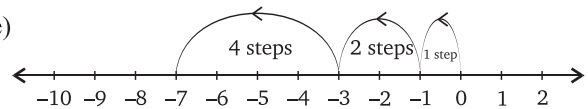


As shown in the above figure, you start from 0 and first move 7 steps to the left reaching -7.

Then you move 14 steps to the right starting from -7. You reach at 7.

Thus, $(-7) + 14 = 7$

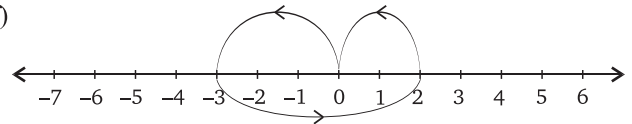
- (e)



As shown in the above figure, you start from 0 and first move 1 step to the left reaching -1. Then you move 2 steps again to the left starting from -1. You reach at -3. And again you move 4 steps to the left starting from -3. You reach at -7.

Thus, $(-1) + (-2) + (-4) = -7$

- (f)



As shown in the above figure, you start from 0 and first move 3 steps to the left reaching -3. Then you move 5 steps again to the right starting from -3. You reach at 2 and again you move 2 steps to the left starting from 2. You reach at 0.

Thus, $(-3) + 5 + (-2) = 0$

2. (a) $(-13) + 18$

$$= -13 + 18$$

$$= 5$$

- (b) $(-45) + 24$

$$= -45 + 24$$

$$= -21$$

- (c) $(-256) + 150$

$$= -256 + 150$$

$$= -106$$

- (d) $(-315) + (-100)$

$$= -315 - 100$$

$$= -415$$

- (e) $(-500) + (-680)$

$$= -500 - 680$$

$$= -1180$$

- (f) $(-20) + 8$

$$= -20 + 8$$

$$= -12$$

- (g) $(-463) + (254)$

$$= -463 + 254$$

$$= -209$$

- (h) $(-1060) + 900$

$$= -1060 + 900$$

$$= -160$$

3. (a) $168 + (-345)$

$$= 168 - 345 = -177$$

- (b) $(-831) + (831)$

$$= -831 + 831 = 0$$

- (c) $(-40) + (-190) + 320$

$$= -40 - 190 + 320$$

$$= -230 + 320 = 90$$

- (d) $(-512) + 69 + 171$

$$= -512 + 240$$

$$= -272$$

4. We rearrange the terms so that positive integers and negative integers are grouped together.

- (a) We have

$$54 + (-3) + (-66) + 17$$

$$= 54 + 17 + (-3) + (-66)$$

$$= 71 - 3 - 66$$

$$= 71 - 69$$

$$= 2$$

- (b) We have

$$(-8) + (-9) + 7 + 18$$

$$= 7 + 18 + (-8) + (-9)$$

$$= 25 - 8 - 9$$

$$= 25 - 17$$

$$= 8$$

- (c) We have

$$30 + (-43) + (-63) + 55 = 30 + 55 + (-43) + (-63)$$

$$= 85 - 43 - 63$$

$$= 85 - 106$$

$$= -21$$

5. (a) True (b) False (c) False

- (d) False (e) False

6. Temperature of Srinagar in the morning = 4°C

Temperature of Srinagar dropped at night = 7°C

So, the temperature of Srinagar at night = $4^{\circ}\text{C} - 7^{\circ}\text{C}$

$$= -3^{\circ}\text{C}$$

NEP Adaptive Education

- (a) $-3 + 5 = 2$ (b) $-8 + 3 = -5$
 (c) $-9 + (-7) = -16$ (d) $-4 + 27 = 23$
 (e) $-2 + (-10) = -12$ (f) $-15 + 15 = 0$
 (g) $-1 + 6 = 5$ (h) $29 + 16 = 45$

Exercise 4.3

- (a) $8 - 3 = 5$ (b) $36 - 21 = 15$ (c) $83 - 90 = -7$
 (d) $-10 - (-18) = -10 + 18 = 8$ (e) $-25 - 15 = -40$ (f) $-46 - (-50) = -46 + 50 = 4$
- (a) $-15 - (-16) = -15 + 16 = 1$ (b) $-286 - (-451) = -286 + 451 = 165$ (c) $-2154 - (5123) = -2154 - 5123 = -7277$
 (d) $-562 - (-1040) = -562 + 1040 = 478$ (e) $52 - (-52) = 52 + 52 = 104$ (f) $0 - (-725) = 0 + 725 = 725$
- (a) $-10 - 5 - (-35) = -10 - 5 + 35 = -15 + 35 = 20$ (b) $-15 + 34 - 14 - 6 = -15 - 14 - 6 + 34 = -35 + 34 = -1$
 (c) $-8 + (-9) + (-80) = -8 - 9 - 80 = -97$ (d) $100 - (-100) - (-100) = 100 + 100 + 100 = 300$
 (e) $-26 + (-13) + (-52) = -26 - 13 - 52 = -91$
 (f) $-13 + (-17) - (-22) - (-40) = -13 - 17 + 22 + 40 = 62 - 30 = 32$
- (a) $34 - 24 = 10$ (b) $-27 + 8 = -19$
 (c) $-7 + 7 = 0$ (d) $841 + (-329) = 512$
- (a) $-2 + (-4) \square (-3) - (-2)$
 (b) $-6 - 5 \square (-6) + (-5)$
 (c) $45 - (-8) \square 57 + (-1)$
 (d) $-83 - (-10) \square -93 + 20$
 (e) $50 - (-40) \square -60 - 30$
 (f) $163 - (-117) \square -163 - 117$
 (g) $-631 + 853 \square -1000 - 115$
 (h) $-78 + 86 \square 97 - 10$

- The temperature on afternoon in Ladakh = $+2^\circ\text{C}$
 The temperature dropped at night in Ladakh = -5°C
 So, the temperature of Ladakh at night = $2^\circ\text{C} + (-5^\circ\text{C}) = 2^\circ\text{C} - 5^\circ\text{C} = -3^\circ\text{C}$
- Submarine 700 m below the sea level = -700 m
 Submarine 250 m ascends = $+250\text{ m}$
 New position of submarine = $-700\text{ m} + 250\text{ m} = -450\text{ m}$.
 So, the submarine is 450 m below sea level.
- Reeta's scores in four successive rounds = 35, -5, -10, 20.
 Thus, the total score of Reeta = $35 + (-5) + (-10) + 20 = 35 - 5 - 10 + 20 = (35 + 20) - (5 + 10) = 55 - 15 = 40$ marks.
- The temperature at Manali on Friday = -4°C
 The temperature dropped on Saturday = -3°C
 So, the temperature at Manali on Saturday = $-4^\circ\text{C} + (-3^\circ\text{C}) = -4^\circ\text{C} - 3^\circ\text{C} = -7^\circ\text{C}$
 And on Sunday, the temperature rise = $+5^\circ\text{C}$
 So, the temperature on Sunday = $-7^\circ\text{C} + 5^\circ\text{C} = -2^\circ\text{C}$
 Hence, the temperature of Manali on Saturday and on Sunday are -7°C and -2°C respectively.
- (a) The temperature was -5°C and drops by 2°C .
 The place has become more colder than before.
 (b) Temperature was 8°C and drops by 3°C .
 The place has become colder than before.
 (c) The temperature was -3°C and increase by 4°C .
 The place has become warmer than before.
 (d) The temperature was 3°C and increases by 5°C .
 The place has become more warmer than before.
 (e) The temperature was -6°C and drops by 7°C . The place has become more colder than before.

MCQs

1. (b) 2. (b) 3. (b) 4. (c) 5. (c) 6. (b) 7. (a) 8. (c) 9. (a) 10. (c)

Exercise 5.1

- (a) and (b) both are algebraic expressions.
- In the algebraic expression $25ab$, 25 is numerical factor and ab are literal factor.
- We have algebraic expression :
 (a) x, b
 (b) $2a, 3b, -c$
 (c) $5ab^2c, -2ab, 7a^2c$

(d) $2ab, 4ac^2, -6z$

- like terms**
 (a) $3a, 8a, -6a$
 (c) $5n, -6p, -6y$
 (d) $-16x, -8y, -3a$
 (e) $-9z, 15z, 8z$
 (f) $-4r, 6r, -9r$

- unlike terms**
 (b) $6b, -4x, 9m$

5. Monomials	Binomials	Trinomials
$3x$	$m+n$	$x+y+z$
$-xyz$	$ab+2c$	$2t+3q+x$

6.

Powered Number	Base	Power/Index
m^4	m	4
x^3	x	3
$(xy)^2$	xy	2
y^{14}	y	14

7. (a) $a \times a \times b \times b = a^2 \times b^2 = (ab)^2$
 (b) $a \times a \times a \times a \times a = a^5$ (c) $x \times x \times x \times x = x^4$
 (d) $pq \times pq \times pq = (pq)^3$
 (e) $mn \times mn \times mn \times mn = (mn)^4$
8. (a) $a^4 = a \times a \times a \times a$ (b) $p^5 = p \times p \times p \times p \times p$
 (c) $(pq)^3 = pq \times pq \times pq$
 (d) $(ab)^4 = ab \times ab \times ab \times ab$
 (e) $y^3 = y \times y \times y$
9. (a) $x^7, x^4, x^{13}, x^{11}, x^2$
 Ascending order = $x^2, x^4, x^7, x^{11}, x^{13}$
 (b) $5x^2, 2x, 4x^4, 3x^3, 7x^5$
 Ascending order = $2x, 5x^2, 3x^3, 4x^4, 7x^5$
10. (a) $D = S \times T$ (b) S.I. = $\frac{P \times R \times T}{100}$
 (c) $A = l \times b$ (d) $A = \frac{1}{2} \times b \times h$
11. (a) $a+5$ (b) $q+p$ (c) $x-9$
 (d) $y-x$ (e) $50b$ (f) $18 \div a$
 (g) $6a+3b$ (h) $y-3$ (i) $10-5x$
 (j) $6a+xy$ (k) $3x-ab$

Mental Maths

- The circumference of a circle in terms of its radius r is πr^2 .
- A mathematical expression formed using arithmetic operations in numbers and variables is known as **Algebraic expression**.
- The equation $\frac{P}{3} - 2 = 0$ expressed in the statement form is "If a number is divided by **three** and then **two** is subtracted from it, the result is **zero**."
- An equation is a statement in which the symbol of **equality** is used.
- Trial and error is one of the methods to obtain the **solution** of an equation.
- Fifty reduced by one-fourth the product of nine and x in algebraic form is $\frac{9x}{4} = 50$.

Exercise 5.2

- If price of diesel = d
 And price of petrol = p

So, according to the question, $d = \frac{p}{2}$

- (a) and (b) are not equations.
- (a) Let the number be x .
 Then, according to question, $x+7=21$
- (b) Let the number be x
 Then, according to question, $3x+1=10$
- (c) Let the number be x
 Then, according to question,
 $7x-10=32$
- (a) $x \div 4 = 7$ (b) $x+y=25$
 (c) $\frac{x+y}{2} = 8$ (d) $x^2 = 12+x$
- (a) $3x+8=17$ (b) $\frac{1}{5}x - \frac{1}{10}x = 3$
- The breadth of rectangular hall = b m
 According to question,
 The length of the rectangular hall = $(3b-4)$ m
- Rakhi travelled on foot = $4x$ km
 She travelled by cycle = $2y$ km
 And, she travelled by bus = 9 km
 So, total distance covered by Rakhi = $(4x+2y+9)$ km
- The height of rectangular box = h cm
 The length of rectangular box = $5h$ cm
 The breadth of rectangular box = $(5h-10)$ cm
- Rahul bought Maths copies = 5
 He bought English copies = $2x$
 And, he bought Hindi copies = y^2
 So, the total number of copies bought by Rahul = $y^2 + 2x + 5$

Exercise 5.3

- The given equation is $5x+10=30$. Since R.H.S. of this equation is 30, therefore, we put several values of x to find L.H.S. till for a particular values of x it become equal to 30.

x	L.H.S.	R.H.S.
1	$5 \times 1 + 10 = 15$	30
2	$5 \times 2 + 10 = 20$	30
3	$5 \times 3 + 10 = 25$	30
4	$5 \times 4 + 10 = 30$	30

Thus, $x = 4$ is the solution of the given equations.

- The given equation is $3x-1=11$. Since R.H.S. of this equation is 11, therefore, we put several values of x to find L.H.S. till for a particular value of x , it becomes equal to 11.

x	L.H.S.	R.H.S.
1	$3 \times 1 - 1 = 2$	11
2	$3 \times 2 - 1 = 5$	11
3	$3 \times 3 - 1 = 8$	11
4	$3 \times 4 - 1 = 11$	11

Thus, $x = 4$ is the solution of the given equation.

3. (a) $x + 5 = 12$

Adding -5 to both the sides, we get

$$x + 5 - 5 = 12 - 5, \quad x = 7$$

$\therefore x = 7$ is the required solution of the equation.

(b) $y - 2 = 10$

Adding $+2$ to both the sides, we get

$$y - 2 + 2 = 10 + 2$$

$$y = 12$$

$\therefore y = 12$ is the required solution of the equation.

(c) $7p = 210$

To find the value of x , eliminate its numerical coefficient of 7 by multiplying both the sides of the equation by $\frac{1}{7}$.

$$7 \times p \times \frac{1}{7} = 210 \times \frac{1}{7}$$

$$p \times 1 = 30 \times 1$$

$$p = 30$$

Hence, $p = 30$ is the solution of the equation $7p = 210$.

(d) $5q = 50$

To find the value of x , eliminate its numerical coefficient of 5 by multiply both the sides of the equation by $\frac{1}{5}$.

$$\text{So, } 5 \times q \times \frac{1}{5} = 50 \times \frac{1}{5}$$

$$\text{or } q \times 1 = 10 \times 1$$

$$\text{or } q = 10$$

Hence, $q = 10$ is the solution of the equation $5q = 50$.

(e) $x + 8 = 12$

Adding -8 (the additive inverse of $+8$) to both the sides, we get

$$x + 8 - 8 = 12 - 8$$

$$x = 4$$

$\therefore x = 4$ is the required solution of the equation.

(f) $2x - 10 = -12$

Adding $+10$ to both the side,

$$\text{we get, } 2x - 10 + 10 = -12 + 10$$

$$2x = -2$$

Now, to find the value of x , eliminate its numerical coefficient of 2 by multiplying both the sides of the equation by $\frac{1}{2}$.

$$\text{So, } 2 \times x \times \frac{1}{2} = -2 \times \frac{1}{2}$$

$$x \times 1 = -1 \times 1$$

$$x = -1$$

Hence, $x = -1$ is the solution of the equation $2x - 10 = -12$.

(g) $9x = 36$

To find the value of x , eliminate its numerical coefficient of 9 by multiplying both the sides of the equation by $\frac{1}{9}$.

$$9 \times x \times \frac{1}{9} = 36 \times \frac{1}{9}$$

$$x \times 1 = 4 \times 1$$

$$\text{or } x = 4$$

Hence, $x = 4$ is the solution of the equation $9x = 36$.

(h) $12x = -108$

To find the value of x , eliminate its numerical coefficient of 12 by multiplying both the sides of the equation by $\frac{1}{12}$.

$$\text{So, } 12 \times x \times \frac{1}{12} = -108 \times \frac{1}{12}$$

$$x \times 1 = -9 \times 1$$

$$\text{or } x = -9$$

Hence, $x = -9$ is the solution of the equation $12x = -108$.

4. (a) $x + 8 = 12$

Adding -8 to both the sides, we get

$$x + 8 - 8 = 12 - 8, \quad x = 4$$

$\therefore x = 4$ is the required solution.

Check : Put $x = 4$ in the given equation.

$$\text{L.H.S.} = 4 + 8 = 12$$

$$\text{R.H.S.} = 12$$

$$\text{i.e., } \text{L.H.S.} = \text{R.H.S.}$$

(b) $15 - x = 3$

Adding -15 to both the sides,

$$\text{we get } 15 - x - 15 = 3 - 15$$

$$-x = -12$$

Cancel the negative sign of the both sides

$$x = 12$$

$\therefore x = 12$ is the solution of the equation.

Check : Put $x = 12$ in the given equation.

$$\text{L.H.S.} = 15 - 12 = 3$$

$$\text{R.H.S.} = 3$$

$$\text{i.e., } \text{L.H.S.} = \text{R.H.S.}$$

(c) $4y = -12$

To find the value of y , eliminate its numerical coefficient of 4 by multiplying both the sides of the equation by $\frac{1}{4}$.

$$\text{So, } 4 \times y \times \frac{1}{4} = -12 \times \frac{1}{4}$$

$$y \times 1 = -3 \times 1$$

$$y = -3$$

Hence, $y = -3$ is the solution of the equation $4y = -12$.

Check : Put $y = -3$ in the given equation.

$$\text{L.H.S.} = 4 \times (-3) = -12$$

$$\text{R.H.S.} = -12$$

$$\text{i.e., } \text{L.H.S.} = \text{R.H.S.}$$

(d) $x - 8 = 16$

Adding $+8$ to both the sides, we get

$$x - 8 + 8 = 16 + 8$$

$$x = 24$$

$\therefore x = 24$ is the required solution.

Check : Put $x = 24$ in the given equation.

$$\text{L.H.S.} = 24 - 8 = 16$$

$$\text{R.H.S.} = 16$$

$$\text{i.e., } \text{L.H.S.} = \text{R.H.S.}$$

5. (a) $19x - 13 = 11x + 35$

$$19x - 11x = 35 + 13$$

$$8x = 48$$

$$x = \frac{48}{8}$$

$$x = 6$$

Hence, $x = 6$ is the solution of the equation.

Check : $19 \times 6 - 13 = 11 \times 6 + 35$

$$114 - 13 = 66 + 35$$

$$101 = 101$$

i.e., L.H.S. = R.H.S.

(b) $2(x-2) - 3(x-3) = 5(x-5)$

$$2x - 4 - 3x + 9 = 5x - 25$$

$$2x - 3x - 5x = 4 - 9 - 25$$

$$2x - 8x = 4 - 34$$

$$-6x = -30$$

Cancel the negative sign both side, we get

$$6x = 30$$

$$x = \frac{30}{6}$$

$$x = 5$$

Hence, $x = 5$ is the solution of the equation.

Check : Put $x = 5$ in the given equation

$$\text{L.H.S.} = 2(5-2) - 3(5-3)$$

$$= 2 \times 3 - 3 \times 2 = 6 - 6 = 0$$

$$\text{R.H.S.} = 5(5-5) = 5 \times 0 = 0$$

i.e., L.H.S. = R.H.S.

6.

$$\frac{y}{4} - \frac{1}{2} = \frac{y}{3} + 1$$

$$\frac{y-2}{4} = \frac{y+3}{3}$$

$$3(y-2) = 4(y+3)$$

$$3y - 6 = 4y + 12$$

$$4y - 3y = -6 - 12$$

$$y = -18$$

Hence, $y = -18$ is the solution of the equation.

Exercise 5.4

1. Let the number be x .

So, According to the question $6x - 10 = 32$

$$6x = 32 + 10$$

$$6x = 42$$

$$x = \frac{42}{6}$$

$$x = 7$$

Hence, the required number is 7.

2. Let the number be x .

So, $x + 8 = 4$

$$x \times \frac{1}{8} = 4$$

$$x = 4 \times 8$$

$$= 32$$

Hence, the required number is 32.

3. Let the number be x .

So, $\frac{1}{3}x + 9 = 19$

$$\frac{1}{3}x = 19 - 9$$

$$\frac{1}{3}x = 10$$

$$x = 10 \times 3$$

$$x = 30$$

Hence, the required number is 30.

4. Let the number be x .

So, according to questions,

$$\frac{1}{4}x - 4 = 8$$

$$\frac{1}{4}x = 8 + 4$$

$$\frac{1}{4}x = 12$$

$$x = 12 \times 4$$

$$x = 48$$

Hence, the required number is 48.

5. Let the number be x .

So, $2x + 3x = 90$

$$5x = 90$$

$$x = \frac{90}{5}$$

$$x = 18$$

Hence, the required number is 18.

6. \therefore Sum of three angles $= 180^\circ$.

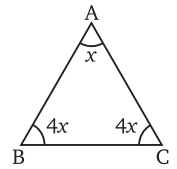
$$\therefore \angle A + \angle B + \angle C = 180^\circ$$

$$x + 4x + 4x = 180^\circ$$

$$9x = 180^\circ$$

$$x = 20^\circ$$

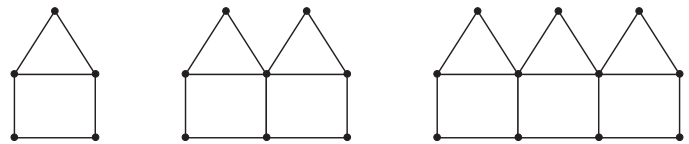
$$\therefore \angle A = x = 20^\circ, \angle B = 4x = 4 \times 20^\circ = 80^\circ \text{ and } \angle C = 80^\circ$$



MCQs

1. (c) 2. (b) 3. (b) 4. (d) 5. (b) 6. (a) 7. (a) 8. (a) 9. (a) 10. (a)

NEP SDGs for Qualitative Education



(a) Number of Mathsticks in 1 hut = 6

Number of Mathsticks in 2 huts = 11

And, number of Mathsticks in 3 huts = 16

So, the rule is :

Number of matchsticks = $5 \times$ Number of huts + 1

$$\therefore \text{Number of Mathsticks in 5 huts} = 5 \times 5 + 1 = 26$$

Number of Mathsticks in 10 huts = $5 \times 10 + 1 = 51$

And, Number of Mathsticks in n huts = $5n + 1$

(b) Let, the number of huts = x

Thus, according to the pattern,

$$5x + 1 = 111$$

$$5x = 111 - 1$$

$$5x = 110$$

$$x = \frac{110}{5} = 22$$

Hence, 22 huts will be involved in a pattern having 111 match sticks.

Exercise 6.1

- (a) The ratio in a village out of 3 people 2 are illiterate = 2 : 3
- (b) The ratio in a dilute acid solution of water and concentric acid = 5 : 9
- (c) The ratio of income and expenditure of a man
= 9000 : 7500 = 6 : 5
- (d) In a school, number of boys : total strength of a section of class VI = 30 : 45 = 2 : 3
- (e) The ratio of speed of two trains = 75 : 60 = 5 : 4
- (f) The ratio of length and breadth of a room = 3b : b
= 3 : 1
- (g) The ratio in a mixture of milk and water = 30 : 5 = 6 : 1

- (a) (i) The required ratio = 100 : 25 = $\frac{100}{25}$

To reduce this ratio in the simplest form, we divide two terms by their common factor 25.

$$\frac{100}{25} = \frac{100 \div 25}{25 \div 25} = \frac{4}{1} = 4 : 1$$

- (ii) The required ratio = 60 : 80 = $\frac{60}{80}$

To reduce this ratio in the simplest form, we divide two terms by their common factor 20.

$$\frac{60}{80} = \frac{60 \div 20}{80 \div 20} = \frac{3}{4} = 3 : 4$$

- (iii) The required ratio = 40 : 75 = $\frac{40}{75}$

To reduce this ratio in the simplest form, we divide the two terms by their common factor 5.

$$\frac{40}{75} = \frac{40 \div 5}{75 \div 5} = \frac{8}{15} = 8 : 15$$

- (iv) The required ratio = 5 × 100 : 75 = $\frac{500}{75}$ ($\because 1 \text{ m} = 100 \text{ cm}$)

To reduce this ratio in the simplest form, we divide the two terms by their common factor 25.

$$\frac{500}{75} = \frac{500 \div 25}{75 \div 25} = \frac{20}{3} = 20 : 3$$

- (v) The required ratio = 72 : 8 × 100 = $\frac{72}{800}$

To reduce this ratio in the simplest form, we divide the two terms by their common factor 8.

$$\frac{72}{800} = \frac{72 \div 8}{800 \div 8} = \frac{9}{100} = 9 : 100$$

- (vi) The required ratio = 8 × 1000 : 560 = 8000 : 560

$$\therefore \frac{8000}{560} = \frac{8000 \div 80}{560 \div 80} = \frac{100}{7} = 100 : 7$$

- (vii) The required ratio = 3 × 1000 : 900

$$\therefore \frac{3000}{900} = \frac{3000 \div 300}{900 \div 300} = \frac{10}{3} = 10 : 3$$

$$\text{(viii) The required ratio} = 15 : 90 = \frac{15}{90}$$

$$\therefore \frac{15}{90} = \frac{15 \div 15}{90 \div 15} = \frac{1}{6} = 1 : 6$$

$$\begin{aligned} \text{(ix) The required ratio} &= 3 \times 60 : 5 \times 60 + 20 \\ &= 180 : 300 + 20 \\ &= 180 : 320 \end{aligned}$$

$$\therefore \frac{180}{320} = \frac{180 \div 20}{320 \div 20} = \frac{9}{16} = 9 : 16$$

$$\text{(x) The required ratio} = 4 \times 60 : 30$$

$$= 240 : 30$$

$$\therefore \frac{240}{30} = \frac{240 \div 30}{30 \div 30} = \frac{8}{1} = 8 : 1$$

$$\text{(b) (i) } \frac{5}{8} \text{ or } \frac{11}{15} \quad \text{(ii) } \frac{12}{25} \text{ or } \frac{25}{48}$$

$$\frac{15 \times 5}{75} < \frac{8 \times 11}{88} \quad \frac{12 \times 48}{576} < \frac{25 \times 25}{625}$$

$$75 < 88 \quad 576 < 625$$

$$\therefore \frac{5}{8} < \frac{11}{15} \quad \therefore \frac{12}{25} < \frac{25}{48}$$

$$3. \text{ (a) } \frac{3}{5} = \frac{9}{15} = \frac{12}{20} = \frac{15}{25} = \frac{24}{40}$$

$$\text{(b) } \frac{2}{7} = \frac{4}{14} = \frac{6}{21} = \frac{20}{70} = \frac{28}{98}$$

- The ratio of their marks = 375 : 360

$$= \frac{375 \div 15}{360 \div 15} = \frac{25}{24} = 25 : 24$$

- Anita's score = 560 out of 600

$$= \frac{560}{600} = \frac{14}{15}$$

And, Suresh's score = 450 out of 500

$$= \frac{450}{500} = \frac{9}{10}$$

$$\text{Now, } \frac{14}{16} = \frac{14 \times 2}{16 \times 2} = \frac{28}{30}$$

$$\text{And, } \frac{9}{10} = \frac{9 \times 3}{10 \times 3} = \frac{27}{30}$$

$$\therefore \frac{28}{30} > \frac{27}{30}$$

Hence, Anita's score is better than Suresh.

- Performance of Kumble = $\frac{3}{5}$

$$\text{And, Performance of Harbhajan} = \frac{2}{4} = \frac{1}{2}$$

$$\text{Now, } \frac{3}{5} = \frac{3 \times 2}{5 \times 2} = \frac{6}{10} \quad \text{and} \quad \frac{1}{2} = \frac{1 \times 5}{2 \times 5} = \frac{5}{10}$$

$$\therefore \frac{6}{10} > \frac{5}{10}$$

Hence, Kumble is more successful than Harbhajan.

7. (a) The ratio of 2 to 5 is equal to (i), (iv) and (v).
So, (ii) and (iii) are not equal to the given ratio.
- (b) The ratio of 7 m and 5 dm is equal to (i) and (ii).
So, (iii), (iv) and (v) are not equal to the given ratio.
8. The monthly income of the man = ₹ 9600
His monthly expenditure = ₹ 7200
∴ His saving in a month = ₹ (9600 – 7200) = ₹ 2400
- (a) The ratio of income to expenditure = ₹ 9600 : ₹ 7200
= 8 : 6 = 4 : 3
- (b) The ratio of saving to income = ₹ 2400 : ₹ 9600
= 1 : 4
9. The total weight of alloy = $\frac{15}{2} + \frac{3}{4} = \frac{30+3}{4} = \frac{33}{4}$ gm
- (a) The ratio of weight of copper to alloy
= $7\frac{1}{2} : \frac{33}{4}$
= $\frac{15}{2} : \frac{33}{4} = \frac{15 \times 4}{33 \times 2}$
= $\frac{5 \times 2}{11 \times 1} = \frac{10}{11} = 10 : 11$
- (b) The ratio of weight of copper to tin
= $7\frac{1}{2} : \frac{3}{4} = \frac{15}{2} : \frac{3}{4}$
= $\frac{15 \times 4}{2 \times 3} = \frac{5 \times 2}{1} = \frac{10}{1} = 10 : 1$
- (c) The ratio of weight of tin to alloy
= $\frac{3}{4} : \frac{33}{4} = \frac{3 \times 4}{33 \times 4}$
= $\frac{3}{33} = 1 : 11$
10. Naresh's income = ₹ 12500
His saving = ₹ 2500
∴ His expenditure = ₹ (12500 – 2500) = ₹ 10000
- (a) The ratio of saving to expenses = ₹ 2500 : ₹ 10000
= $\frac{2500}{10000} = 1 : 4$
- (b) The ratio of savings to earning = 2500 : 12500
= $\frac{2500}{12500} = \frac{1}{5}$
= 1 : 5
- (c) The ratio of earning to expenditure = 12500 : 10000
= $\frac{12500}{10000} = \frac{5}{4} = 5 : 4$
11. Let the length of square A be L
Then, According to the question the length of square B = $\frac{L}{2}$
- (a) The ratio of the sides of B to A = $\frac{L}{2} : L = \frac{1}{2} : 1$
= $\frac{1}{2} = 1 : 2$

(b) The ratio of the area of B to A = $\frac{L}{2} \times \frac{L}{2} : L \times L$
= $\frac{1}{4} : 1 = 1 : 4$

(c) The ratio of the perimeter of A to B = $4 \times L : 4 \times \frac{L}{2}$
= 4 : 2 = 2 : 1

12. A man travels on a cycle

$$\begin{aligned} \text{The speed of a cycle} &= \frac{20 \text{ km}}{3/2 \text{ h}} \\ &= \frac{40}{3} \text{ km/h} \end{aligned}$$

And the man travels on a car

$$\text{The speed of a car} = \frac{120 \text{ km}}{2 \text{ h}} = 60 \text{ km/h}$$

$$\begin{aligned} \therefore \text{The ratio of their speeds} &= \frac{40}{3} : 60 \\ &= 40 : 60 \times 3 \\ &= 40 : 180 \\ &= 4 : 18 \\ &= 2 : 9 \end{aligned}$$

or

13. The total amount = ₹ 900
Sangita gets the money = ₹ $\frac{900}{12+15} \times 12$
= ₹ $\frac{900 \times 12}{27}$
= ₹ $\frac{900 \times 4}{9}$
= ₹ $100 \times 4 = ₹ 400$

Rachita gets the money = ₹ (900 – 400)
= ₹ 500

14. The total amount = ₹ 1560
Suman gets the money = ₹ $\frac{1560}{3+4+5} \times 3$
= ₹ $\frac{1560}{12} \times 3$
= ₹ $\frac{1560}{4} = ₹ 390$

Krishna gets the money = ₹ $\frac{1560}{(3+4+5)} \times 4$
= ₹ $\frac{1560}{12} \times 4$
= ₹ $130 \times 4 = ₹ 520$

And Abir gets the money = ₹ (1560 – 390 – 520)
= ₹ 650

15. If Kiran gets = ₹ 5

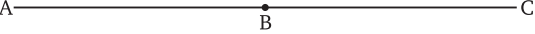
And Kanu gets = ₹ 7

∴ The ratio between Kiran and Kanu = 5 : 7

$$\begin{aligned} \text{Therefore, Kiran gets the money} &= ₹ \frac{2880}{5+7} \times 5 \\ &= ₹ \frac{2880}{12} \times 5 \\ &= ₹ 240 \times 5 \\ &= ₹ 1200 \end{aligned}$$

And Kanu gets the money = ₹ (2880 – 1200) = ₹ 1680

16. The ratio between copper and tin = 5 : 2
 If the total weight of copper = 31.5 gm
 The weight of tin = ?
 \therefore The weight of tin = $\frac{\text{The weight of copper}}{\text{The ratio of copper to tin}}$
 $= \frac{31.5}{5/2} = \frac{31.5}{5} \times 2$
 $= 6.3 \times 2 = 12.6$ gm
17. Rate of orange = ₹ 100 per score
 \therefore Cost of 1 orange = $\frac{\text{₹ 100}}{20} = \text{₹ } 5$
 Rate of apples = ₹ 100 per dozen
 \therefore Cost of 1 apple = $\frac{\text{₹ 100}}{12} = \frac{\text{₹ } 25}{3}$
 Hence, the ratio of the selling price of oranges to apples
 $= \text{₹ } 5 : \text{₹ } \frac{25}{3} = 15 : 25 \Rightarrow 3 : 5$
18. The ratio of expenditure to savings = 7 : 2
 The monthly income = ₹ 13500
 My savings = ?
 \therefore My savings = $\frac{\text{The monthly income}}{\text{The sum of given ratio}} \times \text{Second ratio}$
 $= \text{₹ } \frac{13500}{7+2} \times 2$
 $= \text{₹ } 1500 \times 2$
 $= \text{₹ } 3000$
19. The lesson time of the school
 $= 5$ hours 45 minutes – 45 minutes
 $= 5$ hours
 $= 5 \times 60$ min = 300 min
 The recess time of the school = 15 min + 30 min
 $= 45$ min
 So, the ratio of the recess time to lesson time
 $= 45 : 300 = 3 : 20$

20. A  C

$$AC = 4.5 \text{ cm}$$

$$AB : BC = 7 : 8$$

The length of $AB = \frac{AC}{\text{the sum of ratio}} \times \text{First ratio}$

$$= \left(\frac{4.5}{7+8} \times 7 \right) \text{ cm}$$

$$= \left(\frac{4.5}{15} \times 7 \right) \text{ cm}$$

$$= (0.3 \times 7) \text{ cm} = 2.1 \text{ cm}$$

the length of $BC = (4.5 - 2.1) \text{ cm}$
 $= 2.4 \text{ cm}$

Exercise 6.2

1. (a) $3 : 5 = 15 : 25$

or $\frac{3}{5} = \frac{15}{25}$

$$\frac{3}{5} = \frac{3}{5} \text{ which is proportion}$$

So, $3 : 5 = 15 : 25$ is true.

- (b) $4 : 15 = 16 : 30$

$$\therefore \frac{4}{15} = \frac{16}{30}$$

$$\frac{4}{15} \neq \frac{8}{15} \text{ which is not proportion}$$

So, $4 : 15 = 16 : 30$ is false.

- (c) $7 : 16 = 28 : 32$

or $\frac{7}{16} = \frac{28}{32}$

$$\therefore \frac{7}{16} \neq \frac{7}{8} \text{ which is not proportion.}$$

So, $7 : 16 = 28 : 32$ is false.

- (d) $5 : 24 = 30 : 144$

or $\frac{5}{24} = \frac{30}{144}$

or $\frac{5}{24} = \frac{5}{24}$ which is proportion.

So, $5 : 24 = 30 : 144$ is true.

- (e) $15 : 45 = 75 : 125$

or $\frac{15}{45} = \frac{75}{125}$

$$\therefore \frac{15}{45} \neq \frac{15}{25}$$

So, $15 : 45 = 75 : 125$ is false.

2. (a) 15 cm : 1 m

$$= \frac{15 \text{ cm}}{1 \times 100 \text{ cm}} = \frac{15}{100} \quad (\because 1 \text{ m} = 100 \text{ cm})$$

$$= \frac{3}{20}$$

$$\text{And } 75 \text{ g} : 500 \text{ g} = \frac{75 \text{ g}}{500 \text{ g}} = \frac{3}{20}$$

So, it is in proportion.

- (b) $5 \text{ kg} : 3 \text{ kg } 500 \text{ g} = \frac{5 \text{ kg}}{3 \text{ kg } 500 \text{ g}}$

$$= \frac{5 \times 1000 \text{ g}}{(3 \times 1000 + 500) \text{ g}} \quad (\because 1 \text{ kg} = 1000 \text{ g})$$

$$= \frac{5000}{3500} = \frac{10}{7}$$

$$\text{And } \text{₹ } 150 : \text{₹ } 100 = \frac{\text{₹ } 150}{\text{₹ } 100} = \frac{3}{2} \quad \therefore \frac{10}{4} \neq \frac{3}{7}$$

So, It is not in proportion.

- (c) $6 \text{ km} : 2 \text{ km } 400 \text{ m} = \frac{6 \text{ km}}{2 \text{ km } 400 \text{ m}}$

$$= \frac{6 \times 1000 \text{ m}}{(2 \times 1000 + 400) \text{ m}} \quad (\because 1 \text{ km} = 1000 \text{ m})$$

$$= \frac{6000}{2400} = \frac{5}{2}$$

$$\text{And } 12 \text{ hours} : 4 \text{ hours } 48 \text{ min} = \frac{12 \text{ hours}}{4 \text{ hours} + 48 \text{ min}}$$

$$= \frac{12 \times 60 \text{ min}}{(4 \times 60 + 48) \text{ min}} \quad (\because 1 \text{ h} = 60 \text{ min})$$

$$= \frac{720}{240 + 48} = \frac{720}{288} = \frac{5}{2}$$

So, it is in proportion.

$$(d) 300 \text{ mL} : 2.5 \text{ L} = \frac{300 \text{ mL}}{2.5 \times 1000 \text{ mL}} \quad (\because 1 \text{ L} = 1000 \text{ mL})$$

$$= \frac{300}{2500} = \frac{3}{25}$$

And ₹ 12 : ₹ 96

$$= \frac{12}{96} = \frac{1}{8}$$

$$\therefore \frac{3}{25} \neq \frac{1}{8}$$

So, it is not in proportion.

$$(e) 2 \text{ km} : 800 \text{ m} = \frac{2 \text{ km}}{800 \text{ m}} = \frac{2 \times 1000 \text{ m}}{800 \text{ m}}$$

$$= \frac{20}{8} = \frac{5}{2}$$

$$\text{and } ₹ 75 : ₹ 30 = \frac{75}{30} = \frac{5}{2}$$

So, it is in proportion.

$$3. (a) \text{ Cloth required} = \frac{7.5 \times 15}{4} = 1.875 \times 15 = \mathbf{28.125 \text{ m}}$$

$$(b) \text{ A man take a time} = \frac{150 \times 2}{5} = 30 \times 2 = 60 \text{ min} = \mathbf{1 \text{ hour}}$$

$$(c) \text{ The bags are required} = \frac{485 \times 4}{194} = \frac{1940}{194} = \mathbf{10 \text{ bags.}}$$

$$(d) \text{ The drawing} = \frac{25 \times 5}{2} = \frac{125}{2} = \mathbf{62.5 \text{ km}}$$

$$(e) \text{ We will get the apples} = \frac{12 \times 7}{2} = 6 \times 7 = \mathbf{42 \text{ apples}}$$

4. Let the missing terms be x .

$$(a) x : 16 :: 5 : 40$$

$$\frac{x}{16} = \frac{5}{40}$$

$$x = \frac{5 \times 16}{40} = \frac{16}{8} = 2$$

Hence, the first number is 2.

$$(b) 5 : 7 :: x : 49$$

$$\frac{5}{7} = \frac{x}{49}$$

$$x = \frac{5 \times 49}{7} = 5 \times 7 = 35$$

Hence, the third number is 35.

$$(c) 24 : 6 :: 48 : x$$

$$\frac{24}{6} = \frac{48}{x}$$

$$x = \frac{48 \times 6}{24}$$

$$x = 2 \times 6 = 12$$

Hence, the fourth number is 12.

$$(d) 3 : x :: 15 : 75$$

$$\frac{3}{x} = \frac{15}{75}$$

$$x = \frac{75 \times 3}{15}$$

$$x = 5 \times 3 = 15$$

Hence, the second number is 15.

$$(e) 28 : 4 :: x : 2$$

$$\frac{28}{4} = \frac{x}{2}$$

$$x = \frac{28 \times 2}{4} = 7 \times 2$$

$$x = 14$$

Hence, the third number is 14.

5. (a) We have,

Product of the extremes = $a \times 60$

Product of the means = 30×40

$\therefore a, 30, 40$ and 60 will be in proportion if

$$a \times 60 = 30 \times 40$$

$$\text{or } a = \frac{30 \times 40}{60} = 20$$

\therefore Hence, the value of a is 20.

(b) We have,

Product of the extremes = $a \times 48$

Product of the means = 24×32

$\therefore a, 24, 32$ and 48 will be in proportion if

$$a \times 48 = 24 \times 32$$

$$\text{or } a = \frac{24 \times 32}{48}$$

$$a = 16$$

Hence, the value of a is 16.

(c) We have,

Product of the extremes = 10×60

Product of the means = $b \times 24$

$\therefore 10, b, 24$ and 60 will be in proportion if

$$10 \times 60 = b \times 24$$

$$b = \frac{10 \times 60}{24}$$

$$b = 25$$

Hence, the value of b is 25.

(d) We have,

Product of the extremes = 24×144

Product of the means = $b \times 72$

$\therefore 24, b, 72$ and 144 will be in proportion.

$$\text{If } 24 \times 144 = b \times 72$$

$$b = \frac{24 \times 144}{72}$$

$$b = 48$$

Hence, the value of b is 48.

(e) We have,

Product of the extremes = 12×36

Product of the means = $48 \times c$

$\therefore 12, 48, c$ and 36 will be in proportion if

$$12 \times 36 = 48 \times c$$

$$c = \frac{12 \times 36}{48}$$

$$c = 9$$

Hence, the value of c is 9.

(f) We have,

Product of the extremes = 57×190

Product of the means = $95 \times c$

$\therefore 57, 95, c$ and 190 will be in proportion if

$$57 \times 190 = 95 \times c$$

$$c = \frac{57 \times 190}{95}$$

$$c = 114$$

Hence, the value of c is 114.

6. (a) The three more proportion are (36, 18, 24, 12); (36, 24, 18, 12) and (12, 24, 18, 36).
 (b) The three more proportion are (80, 40, 48, 24); (80, 48, 40, 24) and (24, 48, 40, 80).
 (c) The three more proportion are (240, 80, 120, 40); (240, 120, 80, 40) and (40, 120, 80, 240).

7. Let the third term of the proportion be x .
 Therefore,

$$\begin{aligned} 15 : 25 :: x : 50 \\ \frac{15}{25} &= \frac{x}{50} \\ x &= \frac{50 \times 15}{25} \end{aligned}$$

$$x = 2 \times 15 = 30$$

Hence, the third term is 30.

8. Let the 4th term be x .

Therefore,

$$\begin{aligned} 48 : 96 :: 144 : x \\ \frac{48}{96} &= \frac{144}{x} \\ x &= \frac{144 \times 96}{48} \\ x &= 3 \times 96 \\ x &= 288 \end{aligned}$$

Hence, the fourth term is 288.

9. If four numbers are in proportion, then $\frac{a}{b} = \frac{c}{d}$

- (a) 20 km : 60 km = 3 hours : x

$$\begin{aligned} \frac{20}{60} &= \frac{3}{x} \\ x &= \frac{60 \times 3}{20} \end{aligned}$$

$$x = 3 \times 3 = \mathbf{9 \text{ hours.}}$$

- (b) 5 kg : 12 kg = x : ₹ 48

$$\begin{aligned} \frac{5}{12} &= \frac{x}{\text{₹ } 48} \\ x &= \text{₹ } \frac{48 \times 5}{12} \end{aligned}$$

$$x = \text{₹ } 4 \times 5 = \mathbf{\text{₹ } 20.}$$

- (c) 24 cm : 5 m = ₹ 6 : x

$$\begin{aligned} \frac{24 \text{ cm}}{5 \times 100 \text{ cm}} &= \frac{\text{₹ } 6}{x} \\ \frac{24}{500} &= \frac{\text{₹ } 6}{x} \\ x &= \frac{\text{₹ } 6 \times 500}{24} \end{aligned}$$

$$x = \mathbf{\text{₹ } 125.}$$

10. 4, 6, 9 are said to be in proportion if

$$4 : 6 = 6 : 9$$

$$\text{Now, } 4 : 6 = 4 \div 6 = \frac{4}{6} = \frac{2}{3}$$

$$\text{and } 6 : 9 = 6 \div 9 = \frac{6}{9} = \frac{2}{3}$$

$$\therefore 4 : 6 = 6 : 9$$

i.e., 4, 6, 9 are in proportion.

11. Let the middle term be x .

As, 4, x and 36 are in proportion.

Therefore, $4 : x = x : 36$

$$\frac{4}{x} = \frac{x}{36}$$

$$x^2 = 4 \times 36$$

$$x = \sqrt{4 \times 36}$$

$$x = 2 \times 6$$

$$x = 12$$

Hence, the required term is 12.

12. Let, the car travels x km in 7 hours.

Therefore, 100 km : 3 hours :: x km : 7 hours

$$\frac{100}{3} = \frac{x}{7}$$

$$x = \frac{100 \times 7}{3} = 50 \times 7 = 350 \text{ km.}$$

Hence, the car will travel 350 km in 7 hours.

13. Let the cost of 15 books be ₹ x .

We know that,

Ratio of cost of books and ratio of number of books are proportional.

$$\frac{\text{₹ } x}{\text{₹ } 205} = \frac{15}{5}$$

$$x = \frac{205 \times 15}{5} = 205 \times 3 = 615$$

Hence, the cost of 15 books is ₹ 615.

14. The ratio of boys and girls = 5 : 2

The number of boys = 725

The number of girls = ?

$$\therefore \text{The number of girls} = \frac{\text{The number of boys}}{\text{The given ratio}}$$

$$= \frac{725}{5/2}$$

$$= \frac{725 \times 2}{5}$$

$$= 145 \times 2 = 290$$

15. In 72 min, water lifts = 216 L

In 1 min, water lifts = (216 ÷ 72) L

$$\text{So, In 30 min, water will lifts} = \frac{216}{72} \times 30 \text{ L}$$

$$= \frac{216 \times 30}{72} = 3 \times 30 \text{ L}$$

$$= 90 \text{ L}$$

Hence, 90 L of water can be lift in 30 minutes.

16. In a week, a man earns = ₹ 420

$$\text{In a 1 day, a man earns} = \text{₹ } \frac{420}{7}$$

$$\text{In 30 days, a man will earns} = \text{₹ } \frac{420}{7} \times 30$$

$$= \text{₹ } 60 \times 30 = \text{₹ } 1800$$

17. The ratio of the cost of a ratio and tape-recorder = 3 : 7
 The cost of a tape-recorder = ₹ 3500
 The cost of the ratio = ?
 The cost of the ratio

$$= \frac{\text{first ratio} \times \text{the cost of a tape-recorder}}{\text{second ratio}}$$

$$= ₹ \frac{3 \times 3500}{7} = ₹ 3 \times 500 = ₹ 1500$$

18. The ratio of circumference and diameter of a circle = 22 : 7
 The diameter of a circle = 42 metres
 The length of circumference = ?
 \therefore The length of circumference

$$= \frac{\text{the diameter of a circle}}{\text{second ratio}} \times \text{first ratio}$$

$$= \frac{42 \times 22}{7} = 6 \times 22 = 132 \text{ m.}$$

19. (a) B makes revolutions = $\frac{6}{9} \times 24 = 2 \times 8 = 16$
 (b) A makes revolutions = $\frac{9}{6} \times 14 = 3 \times 7 = 21$

20. (a) The actual length of room = $200 \times 6 \text{ cm}$
 $= 1200 \text{ cm}$
 $= 12 \text{ m}$
 And the actual breadth = $200 \times 5 \text{ cm}$
 $= 1000 \text{ cm}$
 $= 10 \text{ m}$
 (b) The length on the drawing = $\frac{5 \times 100 \text{ cm}}{200}$
 $= \frac{500}{200} \text{ cm} = 2.5 \text{ cm}$

NEP Development of Traditional Knowledge

	a	b	c	d	Product of the extremes	Product of means	Are the numbers Proportional? (Yes/No)
(i)	2	4	5	10	$2 \times 10 = 20$	$4 \times 5 = 20$	Yes
(ii)	7	72	26	206	$7 \times 206 = 1442$	$72 \times 26 = 1872$	No
(iii)	15	35	63	147	$15 \times 147 = 2205$	$35 \times 63 = 2205$	Yes
	a	b	c		Product of the extremes ($a \times c$)	Product of means ($b \times b$)	Are they Proportional? (Yes/No)
(iv)	2	4	8		$2 \times 8 = 16$	$4 \times 4 = 16$	Yes
(v)	35	62	50.4		$35 \times 50.4 = 1764$	$62 \times 62 = 3844$	No
(vi)	63	126	252		$63 \times 252 = 15876$	$126 \times 126 = 15876$	Yes

Exercise 6.3

1. The cost of 3 kg of tea = ₹ 150
 \therefore the cost of 1 kg of tea = ₹ $\frac{150}{3}$
 \therefore the cost of 10 kg of tea = ₹ $\frac{150}{3} \times 10 = ₹ 50 \times 10 = ₹ 500$
 Hence, the cost of 10 kg of tea is ₹ 500.
2. The cost of 15 meters of cloth = ₹ 2850.
 \therefore the cost of 1 meters of cloth = ₹ $\frac{2850}{15}$
 \therefore the cost of 11 meters of cloth = ₹ $\frac{2850}{15} \times 11$
 $= ₹ 190 \times 11 = ₹ 2090$
 Hence, the cost of 11 meters of cloth is ₹ 2090.
3. The cost of 12 tins of biscuits = ₹ 543
 \therefore the cost of 1 tin of biscuits = ₹ $\frac{543}{12}$
 \therefore the cost of 30 tins of biscuits = ₹ $\frac{543}{12} \times 30$
 $= ₹ 45.25 \times 30$
 $= ₹ 1357.50$
 Hence, the cost of 30 tins of biscuits is ₹ 1357.50.

4. The cost of 7 chairs = ₹ 857.50
 \therefore the cost of 1 chair = ₹ $\frac{857.50}{7}$
 \therefore the cost of 5 chairs = ₹ $\frac{857.50}{7} \times 5$
 $= ₹ 122.50 \times 5$
 $= ₹ 612.50$
 Hence, the cost of 5 chairs is ₹ 612.50.
5. The weight of 5 bags of rice = 197.50 kg
 \therefore the weight of 1 bag of rice = $\frac{197.50}{5} \text{ kg}$
 \therefore the weight of 12 bags of rice = $\frac{197.50}{5} \times 12 \text{ kg}$
 $= 39.50 \times 12 \text{ kg}$
 $= 474 \text{ kg}$
 Hence, the weight of 12 such bags of rice is 474 kg.
6. 14 water-tanks can be filled by a pipe = in $3\frac{1}{2} \text{ h}$
 \therefore 1 water-tank can be filled by a pipe = in $\frac{7}{2 \times 14} \text{ h}$
 \therefore 4 such tanks will fill a pipe = in $\frac{7}{2 \times 14} \times 4 \text{ h} = \frac{28}{28} \text{ h} = 1 \text{ h}$
 Hence, 1 hour will be taken by the pipe to fill 4 such tanks.

7. A tank fill = in 1 h 40 min = 60 min + 40 min = 100 min
 $\therefore \frac{3}{10}$ part of tank fill = in $100 \times \frac{3}{10}$ min
= in 10×3 min
= in 30 min
8. The cost of $2\frac{1}{2}$ kg of apples = ₹ 25.40
 \therefore the cost of 1 kg of apples = ₹ $\frac{25.40}{5/2}$
 \therefore the cost of $1\frac{1}{2}$ kg of apples = $\frac{₹ 25.40 \times 2}{5} \times \frac{3}{2}$
= $\frac{₹ 25.40 \times 3}{5}$
= ₹ 5.08×3
= ₹ 15.24
- Hence, the cost of $1\frac{1}{2}$ kg of apples is ₹ 15.24.
9. The weight of 6 packets of biscuits 2 kg 400 g = 2400 g
 \therefore the weight of 1 packet of biscuits = $\frac{2400}{6}$ g
 \therefore the weight of 15 such packets = $\left(\frac{2400}{6} \times 15\right)$ g
= (400×15) g
= 6000 g
= 6 kg
10. In 5 hours, car travels = $35 \times 5 = 175$ km
So, time taken by car to completed the journey at aspeed of
50 km/hr = $\frac{175 \text{ km}}{50 \text{ km/h}} = \frac{175}{50}$ h
= $\frac{175}{50} \times 60$ min
= 35×6 min = 210 min
or = 3 hours 30 min
Hence, the car will take 1 hour 30 minutes to complete the journey.
11. In 6.4 seconds, boy runs = 72 m
 \therefore In 1 second, boy runs = $\frac{72}{6.4}$ m
 \therefore In 4.8 second, boy runs = $\frac{72}{6.4} \times 4.8$ m
= $\frac{9 \times 4.8}{0.8}$ m
= 9×6 m = 54 m
Hence, the boy run 54 metres in 48 seconds.
12. The weight of 6 tins of mustard oil = 1 quintal 47 kg
 \therefore the weight of 1 tin of mustard oil = $\frac{147}{6}$ kg
 \therefore the weight of 15 tins of mustard oil = $\frac{147}{6} \times 15$ kg = 367.5 kg
or = 3 quintals 67.5 kg.
13. The monthly consumption of wheat in a hostel for 250 students = 5500 kg
 \therefore the monthly consumption of wheat in a hostel for 1 student = $\frac{5500}{250}$ kg

$$\begin{aligned} \therefore \text{the monthly consumption of wheat in the hostel for 220} \\ \text{students} &= \frac{5500}{250} \times 220 \\ &= 220 \times 22 = 4840 \text{ kg.} \end{aligned}$$

14. (a) In $2\frac{1}{2}$ hours, dam water-level rises = 3 meters

$$\therefore \text{In 1 hours, dam water level rise} = \frac{3}{5/2} \text{ m}$$

$$\begin{aligned} \therefore \text{In } 1\frac{1}{4} \text{ min, dam water level rise} &= \frac{3}{5} \times \frac{2}{60} \times \frac{5}{4} \text{ m} \\ &= \frac{1}{40} \text{ m} = \frac{100}{40} \text{ cm} \\ &= 2.5 \text{ cm} \end{aligned}$$

$$\text{or} \quad = 2\frac{1}{2} \text{ cm}$$

Hence, the water-level of dam rise 2.5 cm in $1\frac{1}{4}$ min.

- (b) 3 meters rises of water level = in $2\frac{1}{2}$ h

$$\therefore 1 \text{ meters rises of water level} = \text{in } \frac{5}{2 \times 3}$$

$$\begin{aligned} \therefore 9 \text{ meters rises of water level} &= \frac{5}{3 \times 2} \times 9 \\ &= \frac{5 \times 3}{2} \text{ hours} = \frac{15}{2} \text{ hours} \\ &= 7.5 \text{ hours} \end{aligned}$$

Hence, the water level of dam will rise 9 metres in 7.5 hours.

15. 28×10^3 km of distance travelled by the light = in 1 sec

$$\therefore 1 \text{ km of distance travelled by light} = \text{in } \frac{1}{28 \times 10^3} \text{ sec}$$

So, 210×10^6 km of distance travelled by light

$$= \text{in } \frac{1}{28 \times 10^3} \times 210 \times 10^6 \text{ sec}$$

$$= 75 \times 10^2 \text{ sec}$$

$$= 7500 \text{ sec or } \frac{7500}{3600} \text{ hr}$$

$$= 2 \text{ hour } 5 \text{ minutes}$$

Hence, the light travell 210×10^6 km in 2 hours 5 minutes.

16. (a) The cost of 25 packets of sweet = ₹ 625

$$\therefore \text{the cost of 1 packet of sweet} = ₹ \frac{625}{25} = ₹ 25$$

$$\therefore \text{the cost of 47 packets of sweet} = ₹ 25 \times 47 = ₹ 1175$$

- (b) In ₹ 625, purchase the packets of sweet = 25

$$\text{In ₹ 1, purchase the packets of sweet} = \frac{25}{625}$$

$$\text{In ₹ 725, purchase the packets of sweet} = \frac{25}{625} \times 725$$

$$= 29 \text{ packets}$$

Hence, 29 packets can be purchased in ₹ 725.

17. (a) 350 quintals yield of wheat required = 5 hectares

$$\therefore 1 \text{ quintals yield of wheat required} = \frac{5 \times 10000}{350} \text{ m}^2$$

$$\begin{aligned} \therefore 175 \text{ quintals will yield of wheat required} \\ &= \frac{50000}{350} \times 175 \text{ m}^2 \\ &= \frac{50000}{2} \text{ m}^2 = 25000 \text{ m}^2 \end{aligned}$$

(b) The yield of wheat from 5 hectares of land = 350 quintals
The yield of wheat from 1 m² of land = $\frac{350}{50000}$ quintals

The yield of wheat from 500 m² of land

$$= \frac{350}{50000} \times 500 \text{ quintals}$$

$$= \frac{35}{10} \text{ quintals}$$

$$= 3.5 \text{ quintals}$$

18. (a) 15 men can do a piece of land of work in = 14 days
 \therefore 1 man can do the same work in = 14×15 days
 \therefore 35 men can do the same work in = $\frac{14 \times 15}{35}$ days
 $= 2 \times 3 = 6$ days.

- (b) In 14 days, finished the work = 15 men
 \therefore In 1 day, finished the work = 15×14 men

$$\begin{aligned} \therefore \text{ In 10 days, finished the work} &= \frac{15 \times 14}{10} \text{ men} \\ &= 3 \times 7 \text{ men} \\ &= 21 \text{ men.} \end{aligned}$$

19. Clearly, more the number of men will take less time.
And, less the number of men will take more time.

So, 250 men for provisions = 40 days

\therefore 1 man for provisions = 40×250 days

\therefore (250 + 150) men for provisions = $\frac{40 \times 250}{400}$ days = 25 days.

Thus, the provisions will last for 25 days.

20. Clearly, less men consume provisions more days

So, 550 men for provisions = 72 days

\therefore 1 men for provisions = 72×550 days

\therefore (550 - 150) men for provisions = $\frac{72 \times 550}{400}$ days

= 11×9 days

= 99 days.

Thus, the provisions will last for 99 days.

MCQs

1. (d) 2. (a) 3. (b) 4. (d) 5. (c) 6. (b) 7. (a) 8. (c)

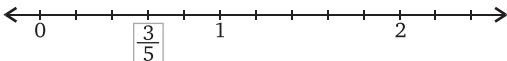
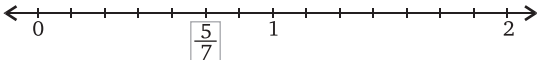
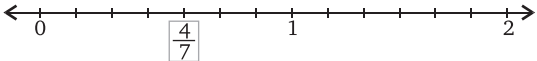
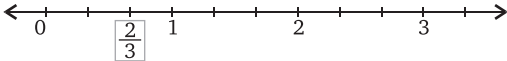
Chapter

7

Fractions

Exercise 7.1

1. (a) $\frac{2}{3}$ (b) $\frac{4}{5}$ (c) $\frac{4}{7}$
 (d) $\frac{5}{12}$ (e) $\frac{8}{9}$ (f) $\frac{3}{10}$
2. (a) four-ninths (b) two-sevenths (c) one-thirds
 (d) three-fourths (e) seven-eighths (f) nine-sixteenths
3. (a) In the fraction $\frac{5}{11}$, 5 is the numerator and 11 is the denominator.
 (b) In the fraction $\frac{1}{7}$, 1 is the numerator and 7 is the denominator.
 (c) In the fraction $\frac{6}{13}$, 6 is the numerator and 13 is the denominator.
 (d) In the fraction $\frac{7}{19}$, 7 is the numerator and 19 is the denominator.
 (e) In the fraction $\frac{9}{21}$, 9 is the numerator and 21 is the denominator.
 (f) In the fraction $\frac{11}{23}$, 11 is the numerator and 23 is the denominator.

4. (a) $\frac{3}{8}$ (b) $\frac{8}{11}$ (c) $\frac{11}{25}$ (d) $\frac{13}{29}$
5. (a) 
 (b) 
 (c) 
 (d) 
6. (a) The collection = $\frac{3}{5}$ of 20 balloons
 $= \frac{3}{5} \times 20$ balloons = 3×4 balloons
 $= 12$ balloons.
 (b) The collection = $\frac{3}{5}$ of 25 pens
 $= \frac{3}{5} \times 25$ pens = 3×5 pens
 $= 15$ pens.
 (c) The collection = $\frac{3}{5}$ of 45 toffees.
 $\therefore = \frac{3}{5} \times 45$ toffees = 3×9 toffees
 $= 27$ toffees.

Exercise 7.2

1. (a) The fraction = $\frac{3}{5}$
 $\therefore \frac{3 \times 2}{5 \times 2} = \frac{6}{10}, \frac{3 \times 3}{5 \times 3} = \frac{9}{15}$
 $\frac{3 \times 4}{5 \times 4} = \frac{12}{20}, \frac{3 \times 5}{5 \times 5} = \frac{15}{25}$
 So, the four fractions equivalent to $\frac{3}{5}$ are $\frac{6}{10}, \frac{9}{15}, \frac{12}{20}$ and $\frac{15}{25}$.
- (b) The fraction = $\frac{4}{7}$
 $\therefore \frac{4 \times 2}{7 \times 2} = \frac{8}{14}, \frac{4 \times 3}{7 \times 3} = \frac{12}{21}, \frac{4 \times 4}{7 \times 4} = \frac{16}{28}, \frac{4 \times 5}{7 \times 5} = \frac{20}{35}$
 So, the four fractions equivalent to $\frac{4}{7}$ are $\frac{8}{14}, \frac{12}{21}, \frac{16}{28}$ and $\frac{20}{35}$.
- (c) The fraction = $\frac{6}{11}$
 $\therefore \frac{6 \times 2}{11 \times 2} = \frac{12}{22}, \frac{6 \times 3}{11 \times 3} = \frac{18}{33}, \frac{6 \times 4}{11 \times 4} = \frac{24}{44}, \frac{6 \times 5}{11 \times 5} = \frac{30}{55}$
 So, the four fractions equivalent to $\frac{6}{11}$ are $\frac{12}{22}, \frac{18}{33}, \frac{24}{44}$ and $\frac{30}{55}$.
- (d) The fraction = $\frac{8}{13}$
 $\therefore \frac{8 \times 2}{13 \times 2} = \frac{16}{26}, \frac{8 \times 3}{13 \times 3} = \frac{24}{39}, \frac{8 \times 4}{13 \times 4} = \frac{32}{52}, \frac{8 \times 5}{13 \times 5} = \frac{40}{65}$
 So, the four fractions equivalent to $\frac{8}{13}$ are $\frac{16}{26}, \frac{24}{39}, \frac{32}{52}$ and $\frac{40}{65}$.
- (e) The fraction = $\frac{7}{9}$
 $\therefore \frac{7 \times 2}{9 \times 2} = \frac{14}{18}, \frac{7 \times 3}{9 \times 3} = \frac{21}{27}, \frac{7 \times 4}{9 \times 4} = \frac{28}{36}, \frac{7 \times 5}{9 \times 5} = \frac{35}{45}$
 So, the four fractions equivalent to $\frac{7}{9}$ are $\frac{14}{18}, \frac{21}{27}, \frac{28}{36}$ and $\frac{35}{45}$.
- (f) The fraction = $\frac{5}{12}$
 $\therefore \frac{5 \times 2}{12 \times 2} = \frac{10}{24}, \frac{5 \times 3}{12 \times 3} = \frac{15}{36}, \frac{5 \times 4}{12 \times 4} = \frac{20}{48}, \frac{5 \times 5}{12 \times 5} = \frac{25}{60}$
 So, the four fractions equivalent to $\frac{5}{12}$ are $\frac{10}{24}, \frac{15}{36}, \frac{20}{48}$ and $\frac{25}{60}$.

2. (a) We have $\frac{2}{3}$ and $\frac{33}{22}$
 Cross multiplying, we have $\frac{2}{3} \times \frac{33}{22}$
 Now, $2 \times 22 = 44$ and $3 \times 33 = 99$
 $\therefore 2 \times 22 \neq 3 \times 33$
 So, $\frac{2}{3}$ and $\frac{33}{22}$ are not equivalent fractions.

- (b) We have $\frac{1}{3}$ and $\frac{9}{24}$
 Cross multiplying, we have $\frac{1}{3} \times \frac{9}{24}$
 Now, $1 \times 24 = 24$ and $3 \times 9 = 27$
 $\therefore 1 \times 24 \neq 3 \times 9$
 So, $\frac{1}{3}$ and $\frac{9}{24}$ are not equivalent fractions.

- (c) We have $\frac{2}{9}$ and $\frac{14}{63}$
 Cross multiplying, we have $\frac{2}{9} \times \frac{14}{63}$
 Now, $2 \times 63 = 126$ and $9 \times 14 = 126$
 $\therefore 2 \times 63 = 9 \times 14$
 So, $\frac{2}{9}$ and $\frac{14}{63}$ are equivalent fractions.

- (d) We have $\frac{4}{7}$ and $\frac{16}{21}$
 Cross multiplying, we have $\frac{4}{7} \times \frac{16}{21}$
 Now, $4 \times 21 = 84$ and $7 \times 16 = 112$
 $\therefore 4 \times 21 \neq 7 \times 16$
 So, $\frac{4}{7}$ and $\frac{16}{21}$ are not equivalent fractions.

- (e) We have $\frac{3}{8}$ and $\frac{15}{40}$
 Cross multiplying, we have $\frac{3}{8} \times \frac{15}{40}$
 $3 \times 40 = 120$ and $8 \times 15 = 120$
 $\therefore 3 \times 40 = 8 \times 15$
 So, $\frac{3}{8}$ and $\frac{15}{40}$ are equivalent fractions.

- (f) We have $\frac{5}{6}$ and $\frac{20}{24}$
 Cross multiplying, we have $\frac{5}{6} \times \frac{20}{24}$
 Now, $5 \times 24 = 120$ and $6 \times 20 = 120$
 $\therefore 5 \times 24 = 6 \times 20$
 So, $\frac{5}{6}$ and $\frac{20}{24}$ are equivalent fractions.

3. Let $\frac{3}{5} = \frac{15}{?}$
 Now, we have to find the missing number.
 To get 15 in the numerator, we multiply 3 by 5. So, we multiply the denominator and numerator by 5.
 $\therefore \frac{3}{5} = \frac{3 \times 5}{5 \times 5} = \frac{15}{25}$

So, $\frac{3}{5}$ and $\frac{15}{25}$ are equivalent fractions.

- Let $\frac{5}{7} = \frac{?}{42}$
 Now, we have to find the missing number.
 To get 42 in the denominator, we multiply 7 by 6. So, we multiply the numerator and denominator by 6.

$$\frac{5}{7} = \frac{5}{7} \times \frac{6}{6} = \frac{30}{42}$$

So, $\frac{5}{7}$ and $\frac{30}{42}$ are equivalent fractions.

5. Let $\frac{4}{9} = \frac{36}{?}$

Now, we have to find the missing number.

To get 36 in the numerator we multiply 4 by 9. So, we multiply the numerator and denominator by 9.

$$\therefore \frac{4}{9} = \frac{4 \times 9}{9 \times 9} = \frac{36}{81}$$

So, $\frac{4}{9}$ and $\frac{36}{81}$ are equivalent fractions.

6. Let $\frac{5}{8} = \frac{?}{72}$

Now, we have to find the missing number.

To get 72 in the denominator, we multiply 8 by 9. So, we multiply the numerator and denominator by 9.

$$\therefore \frac{5}{8} = \frac{5 \times 9}{8 \times 9} = \frac{45}{72}$$

So, $\frac{5}{8}$ and $\frac{45}{72}$ are equivalent fractions.

7. Let $\frac{24}{30} = \frac{4}{?}$

Now, we have to find the missing number.

To get 4 in the numerator, we divide 24 by 6. So, we divide the numerator and denominator by 6.

$$\therefore \frac{24}{30} = \frac{24 \div 6}{30 \div 6} = \frac{4}{5}$$

So, $\frac{24}{30}$ and $\frac{4}{5}$ are equivalent fractions.

8. Let $\frac{50}{60} = \frac{?}{6}$

Now, we have to find the missing number.

To get 6 in the denominator, we divide 60 by 10. So, we divide the numerator and denominator by 10.

$$\therefore \frac{50}{60} = \frac{50 \div 10}{60 \div 10} = \frac{5}{6}$$

So, $\frac{50}{60}$ and $\frac{5}{6}$ are equivalent fractions.

9. (a) L.C.M. of denominators 7, 8, 14 and 16 = 112

$$\text{Now, } \frac{2}{7} = \frac{16 \times 2}{7 \times 16} = \frac{32}{112}, \frac{7}{8} = \frac{7 \times 14}{8 \times 14} = \frac{98}{112}$$

$$\frac{5}{14} = \frac{5 \times 8}{14 \times 8} = \frac{40}{112}, \frac{9}{16} = \frac{9 \times 7}{16 \times 7} = \frac{63}{112}$$

Hence, $\frac{32}{112}, \frac{98}{112}, \frac{40}{112}$ and $\frac{63}{112}$ are like fractions.

(b) L.C.M. of denominators 5, 6, 7, and 10 = 210

$$\text{Now, } \frac{4}{5} = \frac{4 \times 42}{5 \times 42} = \frac{168}{210}, \frac{7}{6} = \frac{7 \times 35}{6 \times 35} = \frac{245}{210}$$

$$\frac{6}{7} = \frac{6 \times 30}{7 \times 30} = \frac{180}{210}, \frac{9}{10} = \frac{9 \times 21}{10 \times 21} = \frac{189}{210}$$

Hence, $\frac{168}{210}, \frac{245}{210}, \frac{180}{210}$ and $\frac{189}{210}$ are like fractions.

(c) L.C.M. of denominators 5, 10, 4 and 7 = 140

$$\text{Now, } \frac{1}{5} = \frac{1 \times 28}{5 \times 28} = \frac{28}{140}, \frac{7}{10} = \frac{7 \times 14}{10 \times 14} = \frac{98}{140}$$

$$\frac{3}{4} = \frac{3 \times 35}{4 \times 35} = \frac{105}{140}, \frac{5}{7} = \frac{5 \times 20}{7 \times 20} = \frac{100}{140}$$

Hence, $\frac{28}{140}, \frac{98}{140}, \frac{105}{140}$ and $\frac{100}{140}$ are like fractions.

(d) L.C.M. of denominator 6, 8, 12 and 10 = 120

$$\text{Now, } \frac{5}{6} = \frac{5 \times 20}{6 \times 20} = \frac{100}{120}, \frac{7}{8} = \frac{7 \times 15}{8 \times 15} = \frac{105}{120}$$

$$\frac{11}{12} = \frac{11 \times 10}{12 \times 10} = \frac{110}{120}, \frac{3}{10} = \frac{3 \times 12}{10 \times 12} = \frac{36}{120}$$

Hence, $\frac{100}{120}, \frac{105}{120}, \frac{110}{120}$ and $\frac{36}{120}$ are like fractions.

(e) L.C.M. of denominator 3, 5, 4 and 6 = 60

$$\text{Now, } \frac{1}{3} = \frac{1 \times 20}{3 \times 20} = \frac{20}{60}, \frac{2}{5} = \frac{2 \times 12}{5 \times 12} = \frac{24}{60}$$

$$\frac{11}{12} = \frac{11 \times 5}{12 \times 5} = \frac{55}{60}, \frac{3}{10} = \frac{3 \times 6}{10 \times 6} = \frac{18}{60}$$

Hence $\frac{20}{60}, \frac{24}{60}, \frac{55}{60}$ and $\frac{18}{60}$ are like fractions.

10. (a) $\frac{8}{10}$

H.C.F. of 8 and 10 is 2. So, divide both the numerator and denominator by 2.

$$\text{So, } \frac{8}{10} = \frac{8 \div 2}{10 \div 2} = \frac{4}{5}, \text{ which is the given fraction in its}$$

lowest term.

(b) $\frac{9}{21}$

H.C.F. of 9 and 21 is 3. So, divide both the numerator and denominator by 3.

$$\text{So, } \frac{9}{21} = \frac{9 \div 3}{21 \div 3} = \frac{3}{7}, \text{ which is the given fraction in its}$$

lowest term.

(c) $\frac{50}{75}$

H.C.F. of 50 and 75 is 25. So, divide both the numerator and denominator by 25.

$$\text{So, } \frac{50}{75} = \frac{50 \div 25}{75 \div 25} = \frac{2}{3}, \text{ which is the given fraction in its}$$

lowest term.

(d) $\frac{40}{120}$

H.C.F. of 40 and 120 is 40. So, divide both the numerator and denominator by 40.

$$\text{So, } \frac{40}{120} = \frac{40 \div 40}{120 \div 40} = \frac{1}{3}, \text{ which is the given fraction in its}$$

lowest term.

(e) $\frac{13}{65}$

H.C.F. of 13 and 65 is 13. So, divide both the numerator and denominator by 13.

So, $\frac{13}{65} = \frac{13 \div 13}{65 \div 13} = \frac{1}{5}$, which is the given fraction in its

lowest term.

(f) $\frac{105}{70}$

H.C.F. of 105 and 70 is 35. So, divide both the numerator and denominator by 35.

So, $\frac{105}{70} = \frac{105 \div 35}{70 \div 35} = \frac{3}{2}$,

which is the given fraction in its lowest term.

Exercise 7.3

1. (a), (c) and (d) are proper fractions.

2. (c) and (d) are improper fractions.

3. (a) $2\frac{1}{5} = \frac{(2 \times 5) + 1}{5} = \frac{10 + 1}{5} = \frac{11}{5}$

(b) $3\frac{1}{4} = \frac{(3 \times 4) + 1}{4} = \frac{12 + 1}{4} = \frac{13}{4}$

(c) $7\frac{1}{8} = \frac{(7 \times 8) + 1}{8} = \frac{56 + 1}{8} = \frac{57}{8}$

(d) $2\frac{1}{11} = \frac{(2 \times 11) + 1}{11} = \frac{22 + 1}{11} = \frac{23}{11}$

4. (a) $\frac{8}{3}$, on dividing 8 by 3, we get

quotient = 2 and remainder = 2

$\therefore \frac{8}{3} = 2 + \frac{2}{3} = 2\frac{2}{3}$.

(b) $\frac{15}{4}$, on dividing 15 by 4, we get

quotient = 3 and remainder = 3

$\therefore \frac{15}{4} = 3 + \frac{3}{4} = 3\frac{3}{4}$.

(c) $\frac{27}{5}$, on dividing 27 by 5, we get

quotient = 5 and remainder = 2

$\therefore \frac{27}{5} = 5 + \frac{2}{5} = 5\frac{2}{5}$.

(d) $\frac{100}{17}$, on dividing 100 by 17, we get

quotient = 5 and remainder = 15

$\therefore \frac{100}{17} = 5 + \frac{15}{17} = 5\frac{15}{17}$.

Exercise 7.4

1. (a) $\frac{3}{5}$ or $\frac{2}{3}$

By cross multiplication, we see that

$\frac{3}{5} \times \frac{2}{3} \Rightarrow 3 \times 3 \text{ and } 5 \times 2$

or 9 and 10.

Since, $9 < 10$

So, $\frac{3}{5} < \frac{2}{3}$.

Hence, $\frac{2}{3}$ is greater.

(b) $\frac{11}{12}$ or $\frac{5}{6}$

By cross multiplication, we see that

$\frac{11}{12} \times \frac{5}{6}$

$\Rightarrow 11 \times 6 \text{ and } 12 \times 5$

or 66 and 60

Since, $66 > 60$

So, $\frac{11}{12} > \frac{5}{6}$

Hence, $\frac{11}{12}$ is greater.

(c) $\frac{5}{9}$ or $\frac{3}{4}$

By cross multiplication

$\frac{5}{9} \times \frac{3}{4}$

$\Rightarrow 5 \times 4 \text{ and } 9 \times 3$

Since, $20 < 27$

So, $\frac{5}{9} > \frac{3}{4}$

Hence, $\frac{3}{4}$ is greater.

2. (a) $\frac{3}{8}$ or $\frac{4}{5}$

By cross multiplying, we see that $\frac{3}{8} \times \frac{4}{5}$

$\Rightarrow 3 \times 5 \text{ and } 8 \times 4$

or $\Rightarrow 15 \text{ and } 32$

Since, $15 < 32$

So, $\frac{3}{8} < \frac{4}{5}$

Hence, $\frac{3}{8}$ is smaller.

(b) $\frac{5}{7}$ or $\frac{3}{7}$

By cross multiplying, we see that $\frac{5}{7} \times \frac{3}{7}$

$\Rightarrow 5 \times 7 \text{ and } 7 \times 3$

$\Rightarrow 35 \text{ and } 21$

Since, $35 > 21$

So, $\frac{5}{7} > \frac{3}{7}$

Hence, $\frac{3}{7}$ is smaller.

(c) $\frac{5}{9}$ or $\frac{3}{5}$

By cross multiplying $\frac{5}{9} \times \frac{3}{5}$

$\Rightarrow 5 \times 5 \text{ and } 9 \times 3$

$\Rightarrow 25 \text{ and } 27$

Since, $25 < 27$

So, $\frac{5}{9} < \frac{3}{5}$

Hence, $\frac{3}{5}$ is smaller.

3. (a) $\frac{3}{4}, \frac{5}{6}, \frac{23}{24}$
 L.C.M. of denominators 4, 6 and 24 = 24
 Hence, the given fractions can be written as
 $\frac{3}{4} = \frac{3 \times 6}{4 \times 6} = \frac{18}{24}, \quad \frac{5}{6} = \frac{5 \times 4}{6 \times 4} = \frac{20}{24}$
 $\frac{23}{24} = \frac{23 \times 1}{24 \times 1} = \frac{23}{24}$
 \therefore Ascending order is $\frac{18}{24} < \frac{20}{24} < \frac{23}{24}$ or $\frac{3}{4} < \frac{5}{6} < \frac{23}{24}$.

(b) $\frac{2}{3}, \frac{5}{9}, \frac{5}{6}, \frac{3}{8}$
 L.C.M. of denominators 3, 9, 6 and 8 = 72
 Hence, the given fractions can be written as
 $\frac{2}{3} = \frac{2 \times 24}{3 \times 24} = \frac{48}{72}, \quad \frac{5}{9} = \frac{5 \times 8}{9 \times 8} = \frac{40}{72}$
 $\frac{5}{6} = \frac{5 \times 12}{6 \times 12} = \frac{60}{72}, \quad \frac{3}{8} = \frac{3 \times 9}{8 \times 9} = \frac{27}{72}$

\therefore Ascending order is $\frac{27}{72} < \frac{40}{72} < \frac{48}{72} < \frac{60}{72}$
 or, $\frac{3}{8} < \frac{5}{9} < \frac{2}{3} < \frac{5}{6}$.

(c) $\frac{5}{6}, \frac{2}{7}, \frac{8}{9}, \frac{1}{3}$
 L.C.M. of denominators 6, 7, 9 and 3 = 126
 Hence, the given fractions can be written as
 $\frac{5}{6} = \frac{5 \times 21}{6 \times 21} = \frac{105}{126}, \quad \frac{2}{7} = \frac{2 \times 18}{7 \times 18} = \frac{36}{126}$
 $\frac{8}{9} = \frac{8 \times 14}{9 \times 14} = \frac{112}{126}, \quad \frac{1}{3} = \frac{1 \times 42}{3 \times 42} = \frac{42}{126}$

\therefore Ascending order is $\frac{36}{126} < \frac{42}{126} < \frac{105}{126} < \frac{112}{126}$
 or $\frac{2}{7} < \frac{1}{3} < \frac{5}{6} < \frac{8}{9}$.

4. (a) $\frac{5}{7}, \frac{3}{8}, \frac{9}{11}$
 L.C.M. of denominators 7, 8 and 11 = 616
 Hence, the given fractions can be written as
 $\frac{5}{7} = \frac{5 \times 88}{7 \times 88} = \frac{440}{616}, \quad \frac{3}{8} = \frac{3 \times 77}{8 \times 77} = \frac{231}{616}$
 $\frac{9}{11} = \frac{9 \times 56}{11 \times 56} = \frac{504}{616}$

\therefore Descending order is $\frac{504}{616} > \frac{440}{616} > \frac{231}{616}$ or $\frac{9}{11} > \frac{5}{7} > \frac{3}{8}$.

(b) $\frac{4}{5}, \frac{7}{15}, \frac{11}{20}, \frac{3}{4}$
 L.C.M. of denominators 5, 15, 20 and 4 = 60
 Hence, the given fractions can be written as
 $\frac{4}{5} = \frac{4 \times 12}{5 \times 12} = \frac{48}{60}, \quad \frac{7}{15} = \frac{7 \times 4}{15 \times 4} = \frac{28}{60}$
 $\frac{11}{20} = \frac{11 \times 3}{20 \times 3} = \frac{33}{60}, \quad \frac{3}{4} = \frac{3 \times 15}{4 \times 15} = \frac{45}{60}$

\therefore Descending order is $\frac{48}{60} > \frac{45}{60} > \frac{33}{60} > \frac{28}{60}$
 or $\frac{4}{5} > \frac{3}{4} > \frac{11}{20} > \frac{7}{15}$.

(c) $\frac{5}{16}, \frac{13}{24}, \frac{7}{8}$
 L.C.M. of denominators 16, 24 and 8 = 48
 Hence, the given fractions can be written as
 $\frac{5}{16} = \frac{5 \times 3}{16 \times 3} = \frac{15}{48}, \quad \frac{13}{24} = \frac{13 \times 2}{24 \times 2} = \frac{26}{48}$
 $\frac{7}{8} = \frac{7 \times 6}{8 \times 6} = \frac{42}{48}$
 \therefore Descending order is $\frac{42}{48} > \frac{26}{48} > \frac{15}{48}$ or $\frac{7}{8} > \frac{13}{24} > \frac{5}{16}$.

Exercise 7.5

1. (a) $\frac{5}{8} + \frac{2}{8} = \frac{5+2}{8} = \frac{7}{8}$
 (b) $\frac{4}{7} + \frac{1}{7} = \frac{4+1}{7} = \frac{5}{7}$
 (c) $\frac{2}{5} + \frac{3}{15} + \frac{7}{10} = \frac{6 \times 2 + 2 \times 3 + 3 \times 7}{30} = \frac{12+6+21}{30} = \frac{39}{30} = \frac{13}{10}$ or $1\frac{3}{10}$
 (d) $\frac{4}{9} + \frac{1}{4} + \frac{5}{6} = \frac{4 \times 4 + 9 \times 1 + 6 \times 5}{36} = \frac{16+9+30}{36} = \frac{55}{36} = 1\frac{19}{36}$
 (e) $1\frac{7}{8} + 1\frac{1}{2} + 1\frac{3}{4} = \frac{15}{8} + \frac{3}{2} + \frac{7}{4} = \frac{15 \times 1 + 4 \times 3 + 2 \times 7}{8} = \frac{15+12+14}{8} = \frac{41}{8} = 5\frac{1}{8}$
 (f) $3\frac{1}{2} + 4\frac{2}{3} + 7\frac{5}{6} = \frac{7}{2} + \frac{14}{3} + \frac{47}{6} = \frac{7 \times 3 + 14 \times 2 + 47 \times 1}{6} = \frac{21+28+47}{6} = \frac{96}{6} = 16$
 (g) $3\frac{3}{4} + 2\frac{1}{6} + 1\frac{5}{8} = \frac{15}{4} + \frac{13}{6} + \frac{13}{8} = \frac{15 \times 6 + 13 \times 4 + 13 \times 3}{24} = \frac{90+52+39}{24} = \frac{181}{24} = 7\frac{13}{24}$
 (h) $\frac{8}{9} + \frac{11}{18} + \frac{13}{27} + \frac{5}{6} = \frac{8 \times 6 + 11 \times 3 + 13 \times 2 + 5 \times 9}{54} = \frac{48+33+26+45}{54} = \frac{152}{54} = \frac{76}{27} = 2\frac{22}{27}$
 2. Mohini purchase the cloth in all = $\left(5\frac{1}{2} + 3\frac{2}{3}\right)$ m
 $= \left(\frac{11}{2} + \frac{11}{3}\right)$ m = $\left(\frac{11 \times 3 + 11 \times 2}{6}\right)$ m
 $= \frac{33+22}{6} = \frac{55}{6}$ m = $9\frac{1}{6}$ m

3. Neha paid money to the shopkeeper

$$\begin{aligned} &= ₹ \left(7\frac{3}{4} + 9\frac{2}{5} \right) \\ &= ₹ \left(\frac{31}{4} + \frac{47}{5} \right) \\ &= ₹ \left(\frac{31 \times 5 + 47 \times 4}{20} \right) \\ &= ₹ \left(\frac{155 + 188}{20} \right) \\ &= ₹ \frac{343}{20} = ₹ 17\frac{3}{20} \end{aligned}$$

4. The total weight of three boys = $\left(15\frac{1}{2} + 16\frac{3}{4} + 17\frac{1}{5} \right)$ kg

$$\begin{aligned} &= \left(\frac{31}{2} + \frac{67}{4} + \frac{86}{5} \right) \text{ kg} \\ &= \left(\frac{31 \times 10 + 67 \times 5 + 86 \times 4}{20} \right) \text{ kg} \\ &= \left(\frac{310 + 335 + 344}{20} \right) \text{ kg} \\ &= \frac{989}{20} \text{ kg} = 49\frac{9}{20} \text{ kg.} \end{aligned}$$

5. Total weight of these three empty boxes

$$\begin{aligned} &= \left(17\frac{3}{4} + 5\frac{1}{2} + 9\frac{1}{5} \right) \text{ kg} \\ &= \left(\frac{71}{4} + \frac{11}{2} + \frac{46}{5} \right) \text{ kg} \\ &= \left(\frac{71 \times 5 + 11 \times 10 + 46 \times 4}{20} \right) \text{ kg} \\ &= \left(\frac{355 + 110 + 184}{20} \right) \text{ kg} \\ &= \frac{649}{20} \text{ kg} = 32\frac{9}{20} \text{ kg.} \end{aligned}$$

Exercise 7.6

1. (a) $\frac{3}{8} - \frac{1}{8} = \frac{3-1}{8}$
 $= \frac{2}{8} = \frac{1}{4}$

(c) $\frac{11}{14} - \frac{9}{14} = \frac{11-9}{14}$
 $= \frac{2}{14} = \frac{1}{7}$

(e) $\frac{11}{12} - \frac{13}{16} = \frac{11 \times 4 - 13 \times 3}{48}$
 $= \frac{44 - 39}{48}$
 $= \frac{5}{48}$

(g) $2\frac{3}{4} - 1\frac{5}{6}$
 $= \frac{11}{4} - \frac{11}{6}$

(b) $\frac{7}{9} - \frac{2}{9} = \frac{7-2}{9}$
 $= \frac{5}{9}$

(d) $\frac{4}{3} - \frac{5}{6} = \frac{4 \times 2 - 5}{6}$
 $= \frac{8-5}{6} = \frac{3}{6} = \frac{1}{2}$

(f) $\frac{5}{8} - \frac{7}{12} = \frac{5 \times 3 - 7 \times 2}{24}$
 $= \frac{15-14}{24}$
 $= \frac{1}{24}$

(h) $6\frac{2}{3} - 3\frac{3}{4}$
 $= \frac{20}{3} - \frac{15}{4}$

$$\begin{aligned} &= \frac{11 \times 3 - 11 \times 2}{12} \\ &= \frac{33 - 22}{12} = \frac{11}{12} \end{aligned}$$

(i) $3\frac{5}{8} - 2\frac{5}{12}$
 $= \frac{29}{8} - \frac{29}{12}$
 $= \frac{29 \times 3 - 29 \times 2}{24}$
 $= \frac{87 - 58}{24} = \frac{29}{24}$
 $= 1\frac{5}{24}$

2. (a) $\frac{1}{4} + \frac{1}{6} - \frac{1}{12}$
 $= \frac{3+2-1}{12}$
 $= \frac{5-1}{12}$
 $= \frac{4}{12} = \frac{1}{3}$

(c) $4 + \frac{3}{10} - 1\frac{8}{15}$
 $= \frac{4 \times 30 + 3 \times 3 - 23 \times 2}{30}$
 $= \frac{120 + 9 - 46}{30}$
 $= \frac{83}{30} = 2\frac{23}{30}$

(e) $3\frac{1}{2} + 1\frac{2}{3} - 2\frac{1}{4}$
 $= \frac{7}{2} + \frac{5}{3} - \frac{9}{4}$
 $= \frac{7 \times 6 + 5 \times 4 - 9 \times 3}{12}$
 $= \frac{42 + 20 - 27}{12}$
 $= \frac{62 - 27}{12} = \frac{35}{12} = 2\frac{11}{12}$

(g) $1\frac{2}{3} - \frac{2}{3} - \frac{5}{6}$
 $= \frac{5}{3} - \frac{2}{3} - \frac{5}{6}$
 $= \frac{5 \times 2 - 2 \times 2 - 5}{6}$
 $= \frac{10 - 4 - 5}{6}$
 $= \frac{10 - 9}{6} = \frac{1}{6}$

$$= \frac{80 - 45}{12} = \frac{35}{12} = 2\frac{11}{12}$$

(j) $7 - 5\frac{2}{3}$
 $= 7 - \frac{17}{3}$
 $= \frac{7 \times 3 - 17}{3}$
 $= \frac{21 - 17}{3}$
 $= \frac{4}{3} = 1\frac{1}{3}$

(b) $3\frac{5}{6} - \frac{1}{6} - 1\frac{1}{12}$
 $= \frac{23}{6} - \frac{1}{6} - \frac{13}{12}$
 $= \frac{23 \times 2 - 2 - 13}{12}$
 $= \frac{46 - 15}{12} = \frac{31}{12} = 2\frac{7}{12}$

(d) $1\frac{3}{4} + 2\frac{5}{7} - 1\frac{3}{14}$
 $= \frac{7}{4} + \frac{19}{7} - \frac{17}{14}$
 $= \frac{7 \times 7 + 19 \times 4 - 17 \times 2}{28}$
 $= \frac{49 + 76 - 34}{28} = \frac{125 - 34}{28}$
 $= \frac{91}{28} = 3\frac{7}{28} = 3\frac{1}{4}$

(f) $7\frac{5}{8} - 3\frac{1}{6} - 2\frac{3}{4}$
 $= \frac{61}{8} - \frac{19}{6} - \frac{11}{4}$
 $= \frac{61 \times 3 - 19 \times 4 - 11 \times 6}{24}$
 $= \frac{183 - 76 - 66}{24}$
 $= \frac{183 - 142}{24} = \frac{41}{24} = 1\frac{17}{24}$

(h) $2\frac{5}{12} + 1\frac{19}{60} + 2\frac{11}{40}$
 $= \frac{29}{12} + \frac{79}{60} + \frac{91}{40}$
 $= \frac{29 \times 10 + 79 \times 2 + 91 \times 3}{120}$
 $= \frac{290 + 158 + 273}{120}$
 $= \frac{721}{120} = 6\frac{1}{120}$

3. Let x be added to get 18.

$$\begin{aligned} \therefore x + 8\frac{2}{3} &= 18 \\ x &= 18 - 8\frac{2}{3} \\ x &= 18 - \frac{26}{3} \\ x &= \frac{18 \times 3 - 26}{3} \\ x &= \frac{54 - 26}{3} = \frac{28}{3} \\ x &= 9\frac{1}{3} \end{aligned}$$

Hence, $9\frac{1}{3}$ is the required number.

4. Let x be added to get $7\frac{1}{5}$.

$$\begin{aligned} \therefore x + 5\frac{7}{15} &= 7\frac{1}{5} \\ x + \frac{82}{15} &= \frac{36}{5} \\ x &= \frac{36}{5} - \frac{82}{15} \\ x &= \frac{36 \times 3 - 82}{15} = \frac{108 - 82}{15} = \frac{26}{15} \\ x &= 1\frac{11}{15} \end{aligned}$$

Hence, the required number is $1\frac{11}{15}$.

5. The given fractions $\frac{3}{4}$ and $\frac{5}{7}$.

By cross multiplying, we see that $\frac{3}{4} \times \frac{5}{7}$

$$\Rightarrow 3 \times 7 \text{ and } 4 \times 5$$

or $\Rightarrow 21$ and 20

Since, $21 > 20$

$$\text{So, } \frac{3}{4} > \frac{5}{7}$$

$$\text{And the difference} = \frac{3}{4} - \frac{5}{7} = \frac{3 \times 7 - 5 \times 4}{28} = \frac{21 - 20}{28} = \frac{1}{28}$$

Hence, $\frac{3}{4}$ is greater than $\frac{5}{7}$ by $\frac{1}{28}$.

$$\begin{aligned} 6. \text{ The difference} &= \left[\left(4\frac{5}{6} + 3\frac{1}{9} \right) - \left(2\frac{5}{9} + 2\frac{1}{3} \right) \right] \\ &= \left[\left(\frac{29}{6} + \frac{28}{9} \right) - \left(\frac{23}{9} + \frac{7}{3} \right) \right] \\ &= \left[\left(\frac{29 \times 3 + 28 \times 2}{18} \right) - \left(\frac{23 \times 1 + 7 \times 3}{9} \right) \right] \\ &= \left[\left(\frac{87 + 56}{18} \right) - \left(\frac{23 + 21}{9} \right) \right] \\ &= \left[\frac{143}{18} - \frac{44}{9} \right] = \left[\frac{143 \times 1 - 44 \times 2}{18} \right] = \left[\frac{143 - 88}{18} \right] \\ &= \frac{55}{18} = 3\frac{1}{18} \end{aligned}$$

$$7. \quad \text{A potter earned money} = ₹ 47\frac{1}{2} = ₹ \frac{95}{2}$$

$$\text{He spent the money} = ₹ 18\frac{3}{4} = ₹ \frac{75}{4}$$

$$\begin{aligned} \text{So, the money is left with him} &= ₹ \left(\frac{95}{2} - \frac{75}{4} \right) \\ &= ₹ \left(\frac{95 \times 2 - 75}{4} \right) \\ &= ₹ \left(\frac{190 - 75}{4} \right) \\ &= ₹ \frac{115}{4} = ₹ 28\frac{3}{4} \end{aligned}$$

$$8. \quad \text{Mrs. Khanna bought the milk} = 7\frac{1}{2} \text{ L}$$

$$\text{She consumed the milk} = 6\frac{3}{4} \text{ L}$$

$$\begin{aligned} \text{So, the milk is left with her} &= \left(7\frac{1}{2} - 6\frac{3}{4} \right) \text{ L} \\ &= \left(\frac{15}{2} - \frac{27}{4} \right) \text{ L} \\ &= \left(\frac{15 \times 2 - 27}{4} \right) \text{ L} \\ &= \left(\frac{30 - 27}{4} \right) \text{ L} = \frac{3}{4} \text{ L} \end{aligned}$$

Hence, $\frac{3}{4}$ L of milk is left with her.

$$9. \quad \text{The total length of a rope} = 10\frac{1}{2} \text{ m} = \frac{21}{2} \text{ m}$$

$$\text{Cut off the rope} = 4\frac{5}{8} \text{ m} = \frac{37}{8} \text{ m}$$

$$\begin{aligned} \therefore \text{The length of the remaining rope} &= \left(\frac{21}{2} - \frac{37}{8} \right) \text{ m} \\ &= \left(\frac{21 \times 4 - 37}{8} \right) \text{ m} \\ &= \left(\frac{84 - 37}{8} \right) \text{ m} \\ &= \frac{47}{8} \text{ m} = 5\frac{7}{8} \text{ m} \end{aligned}$$

Hence, the length of the remaining rope is $5\frac{7}{8}$ m.

$$10. \quad \text{Saroj bought wheat} = ₹ 12\frac{1}{2} = ₹ \frac{25}{2}$$

$$\text{She bought of rice} = ₹ 25\frac{3}{4} = ₹ \frac{103}{4}$$

$$\text{She bought of vegetables} = ₹ 10\frac{1}{4} = ₹ \frac{41}{4}$$

She gave money to the shopkeeper = ₹ 100 note.

So, he will return to her

$$\begin{aligned} &= ₹ \left(100 - \frac{25}{2} - \frac{103}{4} - \frac{41}{4} \right) \\ &= ₹ \left(\frac{100 \times 4 - 25 \times 2 - 103 - 41}{4} \right) \end{aligned}$$

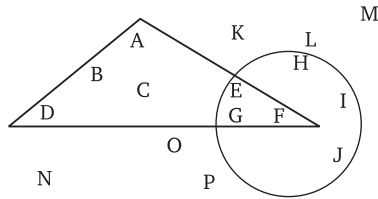
$$= ₹ \left(\frac{400 - 50 - 103 - 41}{4} \right)$$

$$= ₹ \left(\frac{400 - 194}{4} \right) = ₹ \frac{206}{4} = ₹ 51 \frac{1}{2}$$

MCQ's

1. b 2. b 3. a 4. b 5. d 6. d 7. a 8. b 9. b 10. b

NEP The 4Cs : Core Learning Skills



Letters from A to P = 16

- (a) The letters inside the triangle = A, B, C, D, E, F and G
 \therefore Fraction of letters in the triangle = $\frac{7}{16}$
- (b) The letters common to the circle and the triangle
 = E, F and G = 3
 \therefore Fraction of letters common to the circle and the triangle
 = $\frac{3}{16}$
- (c) The letters not in the triangle but inside the circle
 = H, I and J = 3
 \therefore Fraction of letters not in the triangle but inside the circle
 = $\frac{3}{16}$

Chapter

8

Decimals Fractions

Exercise 8.1

1. Whole part

- (a) 0
 (b) 1
 (c) 0
 (d) 21
 (e) 63
 (f) 21
 (g) 16
 (h) 25
 (i) 1

Decimal part

- 57
 21
 651
 635
 793
 935
 108
 169
 738

2. The number of decimal places.

- (a) 3 (b) 2 (c) 1
 (d) 3 (e) 3 (f) 4

3. (a) 7.34 = Seven decimal three four.

- (b) 127.45 = One hundred twenty-seven decimal four five.
 (c) 5.005 = Five decimal zero-zero five.
 (d) 27.35 = Twenty-seven decimal three five.
 (e) 282.161 = Two hundred eighty-two decimal one six one.
 (f) 3512.77 = Three thousand five hundred twelve decimal seven-seven.

4. (a) Ninety-nine hundredths = 0.99

- (b) Sixty-six thousandths = 0.066
 (c) Seventy-five thousand and fifty five hundredths = 75000.55
 (d) Five hundred nineteen and three hundred fifty five thousandths = 519.355

5. (a) $\frac{7}{10} = 0.7$

(b) $\frac{11}{10} = 1.1$

(c) $\frac{13}{10} = 1.3$

(e) $\frac{135}{100} = 1.35$

(g) $\frac{175}{100} = 1.75$

(i) $\frac{51728}{1000} = 51.728$

6. (a) $1.17 = \frac{117}{100}$

(c) $17.5 = \frac{175}{10} = \frac{35}{2}$

(e) $5.7832 = \frac{57832}{10000} = \frac{7229}{1250}$

(g) $105.7 = \frac{1057}{10}$

(i) $2.789 = \frac{2789}{1000}$

(k) $0.38512 = \frac{38512}{100000} = \frac{2407}{6250}$

(l) $1.6783 = \frac{16783}{10000}$

(m) $3.77551 = \frac{377551}{100000}$

(n) $15.2835 = \frac{152835}{10000} = \frac{30567}{2000}$

(o) $7.7189 = \frac{77189}{10000}$

(d) $\frac{11}{100} = 0.11$

(f) $\frac{1765}{1000} = 1.765$

(h) $\frac{17689}{1000} = 17.689$

(b) $0.9 = \frac{9}{10}$

(d) $116.75 = \frac{11675}{100} = \frac{467}{4}$

(f) $10.5 = \frac{105}{10} = \frac{21}{2}$

(h) $60.5 = \frac{605}{10} = \frac{121}{2}$

(j) $6.785 = \frac{6785}{1000} = \frac{1357}{200}$

Exercise 8.2

1.

	Thousandths	Hundredths	Tens	Ones	Decimals	Tenths	Hundredths	Thousandths	Ten Thousandths
a			1	7	.	5	8		
b			6	8	.	0	0	5	
c	1	8	6	5	.	6	3	5	8
d		8	1	5	.	3	3	9	
e		1	5	8	.	2	7		

2. (a) 7. $\textcircled{5}$, the place value of encircled digit = 0.1
 (b) 17.23 $\textcircled{3}$, the place value of encircled digit = 0.005
 (c) 1 $\textcircled{5}$. 331, the place value of encircled digit = 5
 (d) 5.5 $\textcircled{5}$ $\textcircled{6}$, the place value of encircled digit = 0.05 and 0.006
 (e) 23. $\textcircled{4}$ 1 $\textcircled{5}$, the place value of encircled digit = 0.4 and 0.005
 (f) $\textcircled{6}$. $\textcircled{1}$ 9 $\textcircled{8}$, the place value of encircled digit = 6, 0.1 and 0.008

3. (a) $6.53 = 6 + \frac{5}{10} + \frac{3}{100}$
 (b) $7.175 = 7 + \frac{1}{10} + \frac{7}{100} + \frac{5}{1000}$
 (c) $235.238 = 200 + 30 + 5 + \frac{2}{10} + \frac{3}{100} + \frac{8}{1000}$
 (d) $96708.086 = 90000 + 6000 + 700 + 8 + \frac{8}{100} + \frac{6}{1000}$
 (e) $7659.22 = 7000 + 600 + 50 + 9 + \frac{2}{10} + \frac{2}{100}$
 (f) $71.7005 = 70 + 1 + \frac{7}{10} + \frac{5}{10000}$

4. (a) $60 + 5 + 0.500 + 0.070 + 0.007 = 65.577$
 (b) $300 + 60 + 0.200 + 0.06 + 0.005 = 360.265$
 (c) $5 + 0.70 + 0.05 = 5.75$
 (d) $10 + 5 + 0.400 + 0.050 + 0.006 = 15.456$

5. (a) $0.751 = \frac{7}{10} + \frac{5}{100} + \frac{1}{1000}$
 (b) $5.061 = 5 + \frac{0}{10} + \frac{6}{100} + \frac{1}{1000}$
 (c) $16.699 = 10 + 6 + \frac{6}{10} + \frac{9}{100} + \frac{9}{1000}$
 (d) $0.609 = \frac{6}{10} + \frac{0}{100} + \frac{9}{1000}$

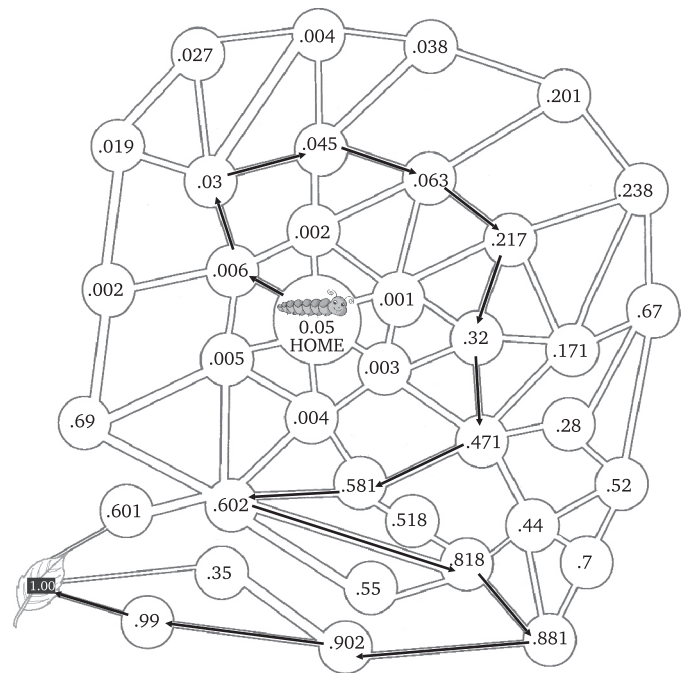
Exercise 8.3

1. (a) 7.8, 3.99, 1.682; like decimals = 7.800, 3.990 and 1.682
 (b) 16.7, 18.36, 2.007; like decimals = 16.700, 18.360 and 2.007

- (c) 561.5, 389.6001, 175.0002; like decimals = 561.5000, 389.6001 and 175.0002
 (d) 0.78, 9.1, 0.0075; like decimals = 0.7800, 9.1000 and 0.0075
 (e) 13.668, 1.2, 6.7389; like decimals = 13.6680, 1.2000 and 6.7389
 (f) 1.95, 6.005, 3.2966 like decimals = 1.9500, 6.0050 and 3.2966.

2. (a) 2.5 Four equivalent decimals of 2.5 are 2.50, 2.500, 2.5000 and 2.50000.
 (b) 0.4 Four equivalent decimals of 0.4 are 0.40, 0.400, 0.4000 and 0.40000.
 (c) 71.5 Four equivalent decimals of 71.5 are 71.50, 71.500, 71.5000 and 71.50000
 (d) 3.89 Four equivalent decimals of 3.89 are 3.890, 3.8900, 3.89000 and 3.890000.
 (e) 12.7 Four equivalent decimals of 12.7 are 12.70, 12.700, 12.7000 and 12.70000.
 (f) 79.85 Four equivalent decimals of 79.85 are 79.850, 79.8500, 79.85000 and 79.850000.
 (g) 36.1 Four equivalent decimals of 36.1 are 36.10, 36.100, 36.1000 and 36.10000.
 (h) 25.45 Four equivalent decimals of 25.45 are 25.450, 25.4500, 25.45000 and 25.450000.

NEP Adaptive Education



Exercise 8.4

1. (a) In 1.678 and 1.687, we have
 Compare the whole number parts.
 we have $1 = 1$
 Now, compare the tenths digit.
 At tenths, we have $6 = 6$
 At last compare the hundredths digit
 At hundredths, we have $7 < 8$
 $\therefore 1.678 < 1.687$

- (b) In 2.40 and 2.4,
First convert the given decimal into like decimals.
we have
2.40 and 2.40
We see that, all the digits come out to be the same.
So, the decimal are equal.
Hence, $2.40 = 2.4$
- (c) In 5.1 and 5.001,
 $5 = 5$ whole number parts of both the decimals are equal.
Now, compare the tenths digit. At tenths, we have $1 > 0$.
 $\therefore 5.1 > 5.001$
- (d) In 71.005 and 71.05,
We have $71 = 71$
(whole number parts of both the decimals are equal.)
Now, compare the tenths digit. Which is also equal.
And compare the hundredths digit.
At hundredths, we have $0 < 5$.
 $\therefore 71.005 < 71.05$
- (e) In 21.6785 and 21.768,
we have, $21 = 21$
(whole number parts of both the decimals are equal.)
Now, compare the tenths digit. At tenths we have, $6 < 7$
 $\therefore 21.6785 < 21.768$
- (f) In 75.128 and 75.218,
We have $75 = 75$
(whole number parts of both the decimals are equal.)
Now, compare the tenths digit. At tenths we have, $1 < 2$.
 $\therefore 75.128 < 75.218$
- (g) In 176.160 and 176.166 (convert into like decimals)
We have $176 = 176$
(whole number part of the both the decimals are equal.)
Tenths and hundredths digits are also same.
Now, compare the thousandths digit. At thousandths, we have $0 < 6$
 $\therefore 176.16 < 176.166$
- (h) In 221.768 and 221.678,
We have $221 = 221$
(whole number part of both the decimals are equal.)
Now, compare the tenths digit. At tenths we have $7 > 6$
 $\therefore 221.768 > 221.678$
- (i) In 73.915 and 73.951,
We have $73 = 73$
(whole number part of both the decimals are equal).
tenths part is also same.
So, we compare hundredths part. At hundredths
we have, $1 < 5$
So, $73.915 < 73.951$.

2. For comparing the given decimals, we must first change the unlike decimals into like decimals,

- (a) $2 = 2.00$, $1.75 = 1.75$, $0.7 = 0.70$ and $1.8 = 1.80$
Comparing the whole number parts
 $2 > 1 = 1 > 0$

In 1.75 and 1.80 compare the digits at the tenths place,
 $7 < 8$

So, 1.80 is greater than 1.75

Therefore, $2.00 > 1.80 > 1.75 > 0.70$

Thus, the required descending order is

$$2 > 1.8 > 1.75 > 0.7$$

- (b) $3.685 = 3.685$, $2.18 = 2.180$, $5.66 = 5.660$ and $3.61 = 3.610$
Compare the whole number parts, $5 > 3 = 3 > 2$
Therefore, 5.660 is the greater number.
Compare the digits at the tenths place, $6 = 6$, it is also same.
Now, compare the digits at the hundredths place, $8 > 1$
Therefore, 3.685 is greater than 3.610.
Therefore, $5.660 > 3.685 > 3.610 > 2.180$
So, the required descending order is $5.66 > 3.685 > 3.61 > 2.18$.

- (c) $6.1 = 6.10$, $1.6 = 1.60$, $1.62 = 1.62$ and $2.16 = 2.16$
Compare the whole number parts

$$6 > 2 > 1 = 1$$

Therefore, 6.10 is the greater number.

In 1.60 and 1.62, the digits at the tenths place is also same part.

Now, compare the digits at the hundredths place, $0 < 2$

Therefore, 1.62 is greater than 1.60.

Therefore, $6.10 > 2.16 > 1.62 > 1.60$

So, the required descending order is $6.1 > 2.16 > 1.62 > 1.6$.

3. For comparing the giving decimals, we must first change the unlike decimals into like decimals.

- (a) $71.6 = 71.600$, $70.86 = 70.860$
 $28.778 = 28.778$ and $29.03 = 29.030$
Comparing the whole number parts $28 < 29 < 70 < 71$
Therefore, $28.778 < 29.030 < 70.860 < 71.600$

Thus, the required ascending order is
 $28.778 < 29.03 < 70.86 < 71.6$

- (b) $189.3 = 189.30$, $169.33 = 169.33$
 $819.28 = 819.28$ and $918.82 = 918.82$
Comparing the whole number parts

$$169 < 189 < 819 < 918$$

Therefore, $169.33 < 189.3 < 819.28 < 918.82$

Thus, the required ascending order is

$$169.33 < 189.30 < 819.28 < 918.82$$

- (c) $718.5 = 718.50$, $817.6 = 817.60$
 $187.67 = 187.67$ and $781.76 = 781.76$
Comparing the whole number parts $187 < 718 < 781 < 817$
Therefore, $187.67 < 718.50 < 781.76 < 817.60$
Thus, the required ascending order is $187.67 < 718.5 < 781.76 < 817.67$

Exercise 8.5

1. First convert all the decimals into like decimals.

- (a) $3.6 = 3.60$, $16.2 = 16.20$ and $18.75 = 18.75$

So, arrange the like decimals in columns and add.

$$\textcircled{1} \textcircled{1}$$

$$3.60$$

$$16.20$$

$$+ 18.75$$

$$\hline 38.55$$

- (b) $5.28 = 5.28$, $1.23 = 1.23$ and $6.1 = 6.10$
So, arrange the like decimals in columns and add.

$$\begin{array}{r} \textcircled{1} \\ 5.28 \\ 1.23 \\ + 6.10 \\ \hline 12.61 \end{array}$$

- (c) $2.25 = 2.25$, $1.7 = 1.70$ and $3.23 = 3.23$
So, arrange the like decimals in columns and add.

$$\begin{array}{r} \textcircled{1} \\ 2.25 \\ 1.70 \\ + 3.23 \\ \hline 7.18 \end{array}$$

- (d) So, arrange the like decimals in columns and add.

$$\begin{array}{r} \textcircled{1} \textcircled{1} \\ 3.10 \\ 7.28 \\ + 1.66 \\ \hline 12.04 \end{array}$$

- (e) $16.2 = 16.200$, $1.62 = 1.620$ and $0.162 = 0.162$
So, arrange the like decimals in columns and add.

$$\begin{array}{r} 16.200 \\ 1.620 \\ + 0.162 \\ \hline 17.982 \end{array}$$

- (f) $8 = 8.00$, $2.6 = 2.60$, $3.2 = 3.20$ and $0.32 = 0.32$
So, arrange the like decimals in columns and add.

$$\begin{array}{r} \textcircled{1} \\ 8.00 \\ 2.60 \\ 3.20 \\ + 0.32 \\ \hline 14.12 \end{array}$$

- (g) $172.5 = 172.50$, $2.85 = 2.85$ and $112.6 = 112.60$
So, arrange the like decimals in columns and add.

$$\begin{array}{r} \textcircled{1} \\ 172.50 \\ 2.85 \\ + 112.60 \\ \hline 287.95 \end{array}$$

- (h) $77.5 = 77.50$, $3.66 = 3.66$ and $1.85 = 1.85$
So, arrange the like decimals in columns and add.

$$\begin{array}{r} \textcircled{1} \textcircled{2} \textcircled{1} \\ 77.50 \\ 3.66 \\ + 1.85 \\ \hline 83.01 \end{array}$$

- (i) $667.12 = 667.12$, $18.68 = 18.68$ and $32.6 = 32.60$
So, arrange the like decimals in columns and add.

$$\begin{array}{r} 667.12 \\ 18.68 \\ + 32.60 \\ \hline 718.40 \end{array}$$

2. (a) $\textcircled{4} \textcircled{10}$ (b) (c) $\textcircled{9} \textcircled{10} \textcircled{7} \textcircled{11}$

$$\begin{array}{r} 50.68 \\ - 38.16 \\ \hline 12.52 \end{array} \quad \begin{array}{r} 83.72 \\ - 10.72 \\ \hline 73.00 \end{array} \quad \begin{array}{r} 100.81 \\ - 32.77 \\ \hline 68.04 \end{array}$$

(d) $\textcircled{1} \textcircled{9} \textcircled{10} \textcircled{6} \textcircled{5}$ (e) $\textcircled{15}$ (f) $\textcircled{8} \textcircled{9} \textcircled{9} \textcircled{10}$

$$\begin{array}{r} 200.75 \\ - 175.08 \\ \hline 25.67 \end{array} \quad \begin{array}{r} 263.76 \\ - 67.38 \\ \hline 196.38 \end{array} \quad \begin{array}{r} 190.00 \\ - 116.75 \\ \hline 73.25 \end{array}$$

3. (a) $\textcircled{9} \textcircled{9} \textcircled{9} \textcircled{10}$ (b) $\textcircled{2} \textcircled{5} \textcircled{17} \textcircled{4} \textcircled{10}$ (c) $\textcircled{2} \textcircled{17}$

$$\begin{array}{r} 100.00 \\ - 78.65 \\ \hline 21.35 \end{array} \quad \begin{array}{r} 136.750 \\ - 28.805 \\ \hline 107.945 \end{array} \quad \begin{array}{r} 33.75 \\ - 12.80 \\ \hline 20.95 \end{array}$$

(d) $\textcircled{11} \textcircled{14}$ (e) $\textcircled{13} \textcircled{13}$ (f) $\textcircled{16} \textcircled{14}$

$$\begin{array}{r} 125.75 \\ - 68.90 \\ \hline 56.85 \end{array} \quad \begin{array}{r} 144.65 \\ - 98.80 \\ \hline 45.85 \end{array} \quad \begin{array}{r} 375.00 \\ - 198.96 \\ \hline 176.04 \end{array}$$

4. First convert all the decimals into like decimals.
And you know that when addition and subtraction are given together, first add the then subtract.

So, rearrange the expression as.

(a) $28.4 - 2.66 + 2.35 = 28.40 - 2.66 + 2.35$
 $= 28.40 + 2.35 - 2.66$
 $= 30.75 - 2.66 = 28.09$

$$\begin{array}{r} \textcircled{1} \\ 28.40 \\ + 2.35 \\ \hline 30.75 \end{array} \quad \begin{array}{r} \textcircled{2} \textcircled{10} \textcircled{6} \textcircled{13} \\ 30.75 \\ - 2.66 \\ \hline 28.09 \end{array}$$

(b) $2.83 - 1.98 + 99.8 - 6.5$
 $= 2.83 - 1.98 + 99.80 - 6.50$
 $= 2.83 + 99.80 - (1.98 + 6.50)$
 $= 102.63 - 8.48 = 94.15$

$$\begin{array}{r} \textcircled{1} \textcircled{1} \\ 2.83 \\ + 99.80 \\ \hline 102.63 \end{array} \quad \begin{array}{r} \textcircled{1} \\ 1.98 \\ + 6.50 \\ \hline 8.48 \end{array} \quad \begin{array}{r} \textcircled{9} \textcircled{12} \textcircled{3} \textcircled{13} \\ 102.63 \\ - 8.48 \\ \hline 94.15 \end{array}$$

(c) $75.2 - 8.68 + 1.25 - 2.5$
 $= 75.20 - 8.68 + 1.25 - 2.50$
 $= 75.20 + 1.25 - (8.68 + 2.50)$
 $= 76.45 - 11.18$
 $= 65.27$

$$\begin{array}{r} 75.20 \\ + 1.25 \\ \hline 76.45 \end{array} \quad \begin{array}{r} \textcircled{1} \\ 8.68 \\ + 2.50 \\ \hline 11.18 \end{array} \quad \begin{array}{r} 76.45 \\ - 11.18 \\ \hline 65.27 \end{array}$$

(d) $77.6 - 35.28 + 78.75$
 $= 77.60 - 35.28 + 78.75$
 $= 77.60 + 78.75 - 35.28$
 $= 156.35 - 35.28$
 $= 121.07$

$$\begin{array}{r} \textcircled{1} \textcircled{1} \\ 77.60 \\ + 78.75 \\ \hline 156.35 \\ - 35.28 \\ \hline 121.07 \end{array}$$

$$\begin{array}{r}
 \text{(e) } 29.6 + 15.2 - 6.9 \\
 = 44.8 - 6.9 \\
 = 37.9
 \end{array}
 \qquad
 \begin{array}{r}
 \textcircled{1} \\
 29.6 \\
 + 15.2 \\
 \hline
 44.8
 \end{array}
 \qquad
 \begin{array}{r}
 \textcircled{13} \\
 \textcircled{3} \textcircled{3} \textcircled{18} \\
 44.8 \\
 - 6.9 \\
 \hline
 37.9
 \end{array}$$

Exercise 8.6

1. The sum of two numbers = 16.25
 One of the number = 9.28
 The other number = ?

$$\begin{array}{r}
 16.25 \\
 - 9.28 \\
 \hline
 6.97
 \end{array}$$

Let the other number be x .

So, according to the question

$$\begin{array}{r}
 x + 9.28 = 16.25 \\
 x = 16.25 - 9.28 \\
 x = 6.97
 \end{array}
 \qquad
 \begin{array}{r}
 ₹ 701.50 \\
 - 35.25 \\
 \hline
 ₹ 736.75
 \end{array}$$

Hence, the other number is 6.97.

2. Ravi had the amount = ₹ 701.50
 So, according to the question
 Shyam had the amount = $x + 35.25$
 where, x is the amount of Ravi
 So, Shyam had money = ₹ $(701.50 + 35.25)$ = ₹ 736.75

3. Johny bought rice = 4.5 kg
 Titoo bought rice = 7.25 kg
 And Albert bought rice = 6 kg
 Weight are given in unlike decimals, so first convert them into like decimals.

$$\begin{array}{r}
 \text{kg} \quad \text{gm} \\
 4.50 \\
 7.25 \\
 + 6.00 \\
 \hline
 17.75
 \end{array}$$

The total weight of rice = $(4.50 + 7.25 + 6.00)$ kg = 17.75 kg
 Hence, 17.75 kg of rice was bought by them all together.

4. First change the distance in like decimals
 Sudhir walked on Tuesday = 5.200 km
 He walked on Wednesday = 7.250 km
 He walked on Thursday = 3.655 km

$$\begin{array}{r}
 \text{km} \quad \text{m} \\
 \textcircled{1} \textcircled{1} \\
 5.200 \\
 7.250 \\
 + 3.655 \\
 \hline
 16.105
 \end{array}$$

So, the total distance walked by sudhir
 = $(5.200 + 7.250 + 3.655)$ km = 16.105 km
 Hence, Sudhir walked 16.105 km during these three days.

5. Abhinav is carrying a bag of mass = 1.75 kg
 His father is carrying another bag of mass = 10.25 kg
 So, the total mass of both bags together = $(1.75 + 10.25)$ kg
 = 12 kg

Hence, the mass of both the bags together is 12 kg.

6. The pocket money of Sanjana = ₹ 75.15
 The pocket money of her brother = ₹ 67.50
 So, the difference of the amount = ₹ $(75.15 - 67.50)$
 = ₹ 7.65

Hence, Sanjana get ₹ 7.65 more as pocket money than her brother.

7. Rakhee had money = ₹ 500
 She bought a purse = ₹ 75.50
 And also bought some medicines = ₹ 121.35
 So, money left with her = ₹ $(500 - 75.50 - 121.35)$
 = ₹ $(500 - 196.85)$
 = ₹ 303.15

Thus, ₹ 303.15 was left with Rakhee.

8. The temperature of three consecutive days = 33.5°C, 40.2°C and 38.3°C

(a) The difference between temperature on Thursday and Tuesday = $(38.3 - 33.5)$ °C
 = 4.8°C

(b) The sum of temperature for three days
 = $(33.5 + 40.2 + 38.3)$ °C
 = 112°C

9. A car fill the petrol = 23400 L
 The two wheeler fill the petrol = 6.250 L
 and An auto-rickshaw fill the petrol = 9.375 L
 ∴ The total petrol was sold = $(23.400 + 6.250 + 9.375)$ L
 = 39.025 L or 39 L 25 mL

10. Sanchita bought fabric = 6.75 m
 She used fabric = 3.45 m
 So, remained fabric = $(6.75 - 3.45)$ m
 = 3.30 m
 Thus, 3.30 m of fabric is left with Sanchita.

Exercise 8.7

1. (a) $3.6 \times 8 = 28.8$ (b) $6.65 \times 1.6 = 10.640$ (c) $3.82 \times 2.6 = 9.932$

(d) $165.2 \times 1.2 = 198.24$ (e) $2.88 \times 3.2 = 9.216$ (f) $3.65 \times 2.4 = 8.760$

(g) $2.65 \times 3.12 = 8.2680$ (h) $7.65 \times 7.1 = 54.315$ (i) $2.862 \times 0.1 = 0.2862$

2. (a) $7.12 \times 10 = 71.2$ (b) $7.68 \times 100 = 768.00$
 (c) $0.0052 \times 1000 = 5.2$ (d) $7.1285 \times 1000 = 7128.5$
 (e) $2.8362 \times 100 = 283.62$ (f) $0.7812 \times 100 = 78.12$

3. (a) $4 \overline{)16.8} (4.2$

$$\begin{array}{r}
 4 \overline{)16.8} \\
 \underline{-16} \\
 8 \\
 \underline{-8} \\
 0
 \end{array}$$

Thus, $16.8 \div 4 = 4.2$

$$\begin{array}{r} \text{(b)} \quad 3 \overline{)200.01} \text{ (66.67)} \\ \underline{-18} \\ 20 \\ \underline{-18} \\ 20 \\ \underline{-18} \\ 21 \\ \underline{21} \\ \times \end{array}$$

Thus, $200.01 \div 3 = 66.67$

$$\begin{array}{r} \text{(c)} \quad 11 \overline{)13.31} \text{ (1.21)} \\ \underline{-11} \\ 23 \\ \underline{-22} \\ 11 \\ \underline{-11} \\ \times \end{array}$$

Thus, $13.31 \div 11 = 1.21$

$$\begin{array}{r} \text{(d)} \quad 16 \overline{)1.76} \text{ (0.11)} \\ \underline{-16} \\ 16 \\ \underline{-16} \\ \times \end{array}$$

Thus, $1.76 \div 16 = 0.11$

$$\begin{array}{r} \text{(e)} \quad 17 \overline{)173.4} \text{ (10.2)} \\ \underline{-17} \\ 34 \\ \underline{-34} \\ \times \end{array}$$

Thus, $173.4 \div 17 = 10.2$

$$\begin{array}{r} \text{(f)} \quad 15 \overline{)500.25} \text{ (33.35)} \\ \underline{-45} \\ 50 \\ \underline{-45} \\ 52 \\ \underline{-45} \\ 75 \\ \underline{-75} \\ \times \end{array}$$

Thus, $500.25 \div 15 = 33.35$

4. (a) $7.165 \div 10 = 0.7165$ (b) $785.16 \div 100 = 7.8516$
 (c) $3368 \div 1000 = 3.368$ (d) $17852 \div 100 = 178.52$
 (e) $28.96 \div 100 = 0.2896$ (f) $7186 \div 1000 = 7.186$

5. (a) $2.24 \div 1.6 = 22.4 \div 16$ (b) $0.408 \div 0.17 = 40.8 \div 17$

$$\begin{array}{r} \therefore 16 \overline{)22.4} \text{ (1.4)} \\ \underline{-16} \\ 64 \\ \underline{-64} \\ \times \end{array}$$

Thus, $2.24 \div 1.6 = 1.4$

$$\begin{array}{r} \therefore 17 \overline{)40.8} \text{ (2.4)} \\ \underline{-34} \\ 68 \\ \underline{-68} \\ \times \end{array}$$

Thus, $0.408 \div 0.17 = 2.4$

$$\begin{array}{r} \text{(c)} \quad 6.25 \div 2.5 = 62.5 \div 25 \\ \therefore 25 \overline{)62.5} \text{ (2.5)} \\ \underline{-50} \\ 125 \\ \underline{-125} \\ \times \end{array}$$

Thus, $6.25 \div 2.5 = 2.5$

$$\begin{array}{r} \text{(d)} \quad 1.331 \div 0.11 = 133.1 \div 11 \\ \therefore 11 \overline{)133.1} \text{ (12.1)} \\ \underline{-11} \\ 23 \\ \underline{-22} \\ 11 \\ \underline{-11} \\ \times \end{array}$$

Thus, $1.331 \div 0.11 = 12.1$

$$\begin{array}{r} \text{(e)} \quad 0.213 \div 0.3 = 2.13 \div 3 \\ \therefore 3 \overline{)2.13} \text{ (0.71)} \\ \underline{-21} \\ 3 \\ \underline{-3} \\ \times \end{array}$$

Thus, $0.213 \div 0.3 = 0.71$

$$\begin{array}{r} \text{(f)} \quad 77.33 \div 1.1 = 773.3 \div 11 \\ \therefore 11 \overline{)773.3} \text{ (70.3)} \\ \underline{-77} \\ 33 \\ \underline{-33} \\ \times \end{array}$$

Thus, $77.33 \div 1.1 = 70.3$

$$\begin{array}{r} \text{(g)} \quad 0.196 \div 2.8 = 1.96 \div 28 \\ \therefore 28 \overline{)1.96} \text{ (0.07)} \\ \underline{-196} \\ \times \end{array}$$

Thus, $0.196 \div 2.8 = 0.07$

$$\begin{array}{r} \text{(h)} \quad 8.005 \div 0.05 = 800.5 \div 5 \\ \therefore 5 \overline{)800.5} \text{ (160.1)} \\ \underline{-5} \\ 30 \\ \underline{-30} \\ 05 \\ \underline{-5} \\ \times \end{array}$$

Thus, $8.005 \div 0.05 = 160.1$

$$\begin{array}{r} \text{(i)} \quad 76.363 \div 0.7 = 763.63 \div 7 \\ \therefore 7 \overline{)763.63} \text{ (109.09)} \\ \underline{-7} \\ 63 \\ \underline{-63} \\ 0063 \\ \underline{-63} \\ \times \end{array}$$

Thus, $76.363 \div 0.7 = 109.09$

$$\begin{array}{r} \text{(j)} \quad 1.296 \div 0.108 = 1296 \div 108 \\ \therefore 108 \overline{)1296} \text{ (12)} \\ \underline{-108} \\ 216 \\ \underline{-216} \\ \times \end{array}$$

Thus, $1.296 \div 0.108 = 12$

$$\begin{array}{r} \text{(k)} \quad 81.33 \div 0.03 = 8133 \div 3 \\ \therefore 3 \overline{)8133} \text{ (2711)} \\ \underline{-6} \\ 21 \\ \underline{-21} \\ 03 \\ \underline{-3} \\ 03 \\ \underline{-3} \\ \times \end{array}$$

Thus, $81.33 \div 0.03 = 2711$

$$\begin{array}{r} \text{(l)} \quad 4.41 \div 0.04 = 441 \div 4 \\ \therefore 4 \overline{)441} \text{ (110.25)} \\ \underline{-4} \\ 04 \\ \underline{-4} \\ 10 \\ \underline{-8} \\ 20 \\ \underline{-20} \\ \times \end{array}$$

Thus, $4.41 \div 0.04 = 110.25$

Exercise 8.8

1. Product of two decimals = 42.63
 One of the decimal = 0.7

$$\begin{aligned} \therefore \text{The other decimal} &= 42.63 \div 0.7 \\ &= 42.63 \div 0.7 \\ &= 426.3 \div 7 = 60.9 \end{aligned}$$

$$\begin{array}{r} \therefore \quad 7 \overline{)426.3} \quad (60.9 \\ \underline{-42} \\ 0063 \\ \underline{-63} \\ \times \end{array}$$

Thus, the other decimal number is 60.9.

- The rate of one metre of cloth = ₹ 46
But Ravi paid for the cloth = ₹ 425.50
 \therefore The length of the cloth = ₹ 425.50 \div ₹ 46
= 9.25 m
Hence, Ravi bought 9.25 m of cloth,
- The rate of one kilogram of resins = ₹ 175.75
 \therefore The rate of 17 kilogram of resins = ₹ 17 \times 175.75
= ₹ 2987.75
- An amount of one day paid by worker = ₹ 87.75
 \therefore The total amount of 23 days paid by worker = ₹ 23 \times 87.75
= ₹ 2018.25
- The total length of string = 72.75 m
Length of one piece of string = 14.55 m
So, the number of pieces of string
= $\frac{\text{Total length of string}}{\text{Length of one piece of string}}$
= $\frac{72.75}{14.55} = \frac{7275}{1455} = 5$ pieces.
- A family consumes wheat per day = 1.750 kg
 \therefore A family consumes wheat in 365 days = 365 \times 1.750 kg
= 638.75 kg

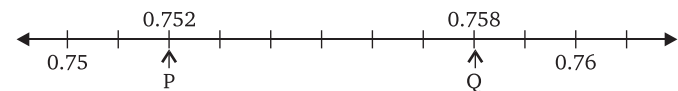
- Hence, the family will consume 638.75 kg of wheat in a year.
- The cloth required for a shirt = 2.5 m
The total length of cloth = 17.5 m
 \therefore Required number of shirts
= $\frac{\text{Total length of cloth}}{\text{The cloth required for a shirt}}$
= $\frac{17.5}{2.5} = \frac{175}{25} = 7$ shirts.
 - The capacity of one bottle = 1.8 L
The total capacity of the milk = 27 L
 \therefore The number of bottles = $\frac{27}{1.8} = \frac{270}{18} = 15$ bottles.
 - The cost of 75 copies of a book = ₹ 2043.75
 \therefore The cost of a single book = ₹ $\frac{2043.75}{75} = ₹ 27.25$
 - A container can hold of water = 5.7 L
The total capacity of water = 74.1 L
 \therefore Number of required container = $\frac{74.1}{5.7} = \frac{741}{57} = 13$ Containers.

MCQ's

1. b 2. c 3. c 4. b 5. d 6. b 7. a 8. a 9. c

NEP Computational and Analytical Thinking

- Write the decimals represented by P and Q on the number-line.



- (a) 2994.989 (b) 2004.080

Chapter

9

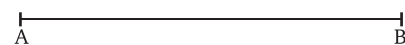
Exercise 9.1

- (a) **Point** = Tip of the pin, a bindic, tip of ice-cream cone
(b) **Line segment** = Boundaries of a black boards, the edges of a table, edges of greeting card etc.
(c) **Ray** = sun rays, light emitted by the torch, a projector.
(d) **Intersecting lines** = adjacent walls of a room, sign of X, both arms of a scissor.
(e) **Parallel lines** = Railway line, opposite sides of a rectangle, opposite sides of a ruler.
-

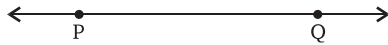
Basic Geometrical Concepts

- (a) (b) (c) (d)

- A **line** : Any line segment PQ when extended indefinitely in both the directions is called line PQ.



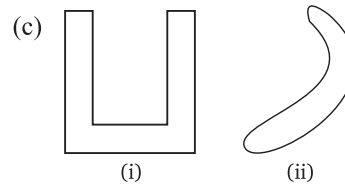
A line segment : A line segment is limited by two end points. It is a length of a straight line between two points A and B .



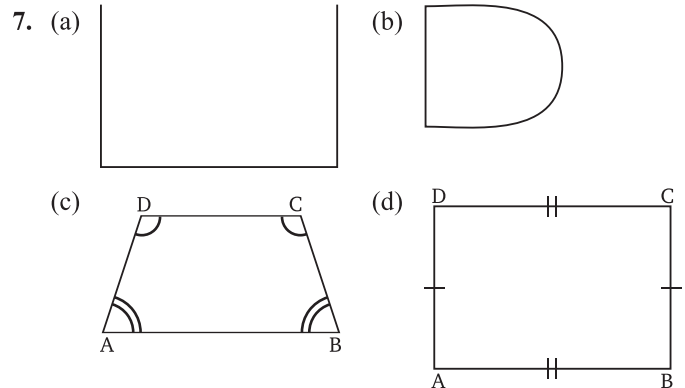
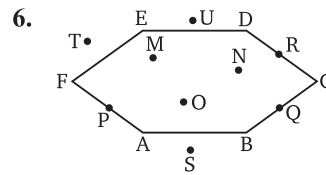
5. A ray \Rightarrow A ray has only one end point.
A line \Rightarrow A line has no end points.
6. (a) $\vec{AP}, \vec{AQ}, \vec{AC}$ and \vec{AD} .
(b) There are 15 line segments are $\overline{PA}, \overline{PB}, \overline{PQ}, \overline{AB}, \overline{AQ}, \overline{AD}, \overline{AC}, \overline{BQ}, \overline{RD}, \overline{RC}, \overline{RS}, \overline{DC}, \overline{DS}, \overline{CS}$ and \overline{BC} .
(c) $\overline{PQ} \parallel \overline{RS}$
(d) $(\overline{AD}, \overline{BC}), (\overline{AD}, \overline{AC}), (\overline{AC}, \overline{BC})$ are not parallel lines.
(e) \overline{AD} and \overline{AC} intersect at A , \overline{AC} and \overline{BC} intersect at C , \overline{PQ} and \overline{AD} intersect at A , \overline{PQ} and \overline{BC} intersect at B and so on.
(f) $\overline{RS}, \overline{AC}, \overline{BC}$ are containing point C .
(g) \overline{PQ} and \overline{BC} are the line on which point B lies.
(h) $\overline{PQ}, \overline{AC}, \overline{AD}$ are the lines passing through point A .
7. (a) Infinite lines can be pass through a point.
(b) Only one line can pass through two points.
8. (a) Yes, B is the mid-point of AC .
(b) Yes, C is the mid-point of BD .
9. $\overline{PX} = \frac{\overline{PQ}}{2} = \frac{15}{2} = 7.5$ cm.
 $\overline{PY} = \frac{\overline{PR}}{2} = \frac{20}{2} = 10$ cm.
 $\overline{XQ} = \overline{PX} = 7.5$ cm and $\overline{YR} = \overline{PY} = 10$ cm.
10. A line contains infinite number of points.
11. (a) A, B, C, D, E, F, G and H are the marked points in the figure.
(b) There are 12 line segments are $\overline{AB}, \overline{BC}, \overline{CD}, \overline{DA}, \overline{AE}, \overline{DH}, \overline{BF}, \overline{CG}, \overline{EH}, \overline{HG}, \overline{FG}$ and \overline{EF} are the name.
(c) $\overline{BF}, \overline{EF}$ and \overline{GF} are the line segments meeting at point F .
(d) $\overline{AB}, \overline{CB}, \overline{FB}$ are the line segments meeting at point B .
(e) $\overline{AB} \parallel \overline{DC}, \overline{AD} \parallel \overline{BC}, \overline{EF} \parallel \overline{HG}, \overline{EH} \parallel \overline{FG}$ are the groups of four parallel line segments.
12. (a) False (b) True (c) True (d) False
(e) False (f) False (g) True (h) False
(i) True (j) False (k) True (l) True

Exercise 9.2

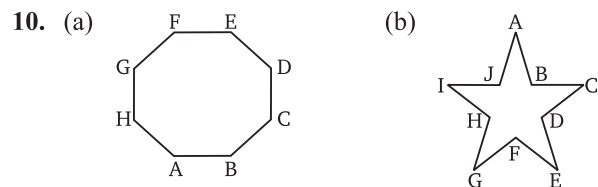
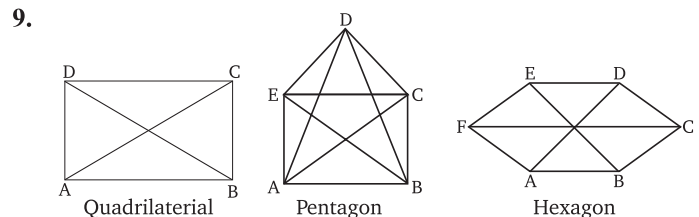
1. (i) Open curves = (c), (e), (f), and (h)
(ii) Closed curves = (a), (b), (d) and (g)
2. (a), (d) and (g) are simple closed curves.
3. Do it yourself
4. (a) (i) (ii) (i) (ii)



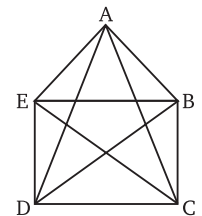
5. (a), (c) and (g) are polygons.



8. (a) Two (b) Closed curve (c) Triangle (d) Quadrilateral

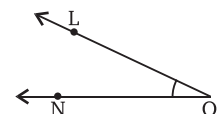


11. (a) A, B, C, D and E are vertices.
(b) $(AB, BC); (BC, CD); (CD, DE); (DE, EA)$ and (EA, AB) are adjacent sides.
(c) $(A, B), (B, C), (C, D)$ and (D, A) are the pair of adjacent vertices.
(d) $\overline{AC}, \overline{AD}, \overline{BE}, \overline{BD}$ and \overline{EC} are the diagonals of the given pentagon.

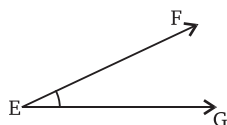


Exercise 9.3

1. Clock hands, scissor and sides of a table are the examples of angles.
2. (i) O is vertex.
(ii) \overline{LO} and \overline{NO} are arms of the angle.



3. (a) In figure, there are 3 angles. And angles are $\angle A$, $\angle B$ and $\angle C$.
 (b) In figure, there are 4 angles. And angles are $\angle P$, $\angle Q$, $\angle R$ and $\angle S$.
 (c) In figure, there are 12 angles. And angles are $\angle HEG$, $\angle GEF$, $\angle HEF$, $\angle EFH$, $\angle HFG$, $\angle EFG$, $\angle FGE$, $\angle HGE$, $\angle FGH$, $\angle GHF$, $\angle FHE$ and $\angle GHE$.
4. (a) G, D, E, F and H are the interior points of $\angle ABC$.
 (b) L, M and K are exterior points of $\angle ABF$.
 (c) Points A, B, C, I and J are lie on $\angle ABC$.
 (d) Points C, B, F, I, D and E are lie on $\angle CBF$.
5. $\angle ABC$ and $\angle CBA$ are some angles in given figure.
 6. Do it yourself

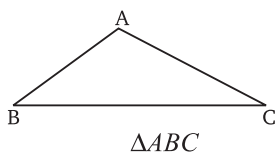


7. Yes, they always form an angle.
 8. No.

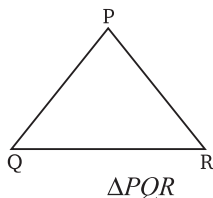
Exercise 9.4

1. (b), (e) are triangles.

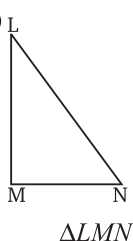
2. (a)



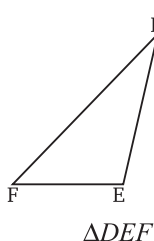
- (b)



- (c)



- (d)

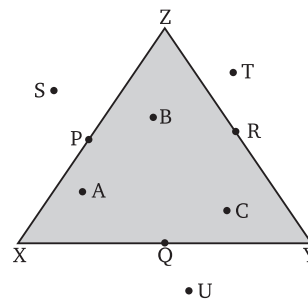


3. (a) In $\triangle ABC$
Sides : AB, BC and AC .
Angles : $\angle A, \angle B$, and $\angle C$.
 (b) In $\triangle PQR$
Sides : PQ, QR and PR .
Angles : $\angle P, \angle Q$, and $\angle R$.
 (c) In $\triangle LMN$
Sides : LM, MN and LN .
Angles : $\angle L, \angle M$, and $\angle N$.

- (d) In $\triangle DEF$
Sides : DE, EF and DF .
Angles : $\angle D, \angle E$, and $\angle F$.

4. (a) There are 3 triangles, $\triangle ABD, \triangle ADC$ and $\triangle ABC$.
 (b) There are 5 triangles, $\triangle PQR, \triangle PSU, \triangle STU, \triangle SQT$ and $\triangle UTR$.
 (c) There are 8 triangles, $\triangle EOF, \triangle FOG, \triangle GOH, \triangle HOE, \triangle HEF, \triangle HEG, \triangle GHF$ and $\triangle GEF$.
 (d) There are 6 triangles, $\triangle ABC, \triangle ABD, \triangle ABE, \triangle ACE, \triangle ACD$ and $\triangle ADE$.

- 5.

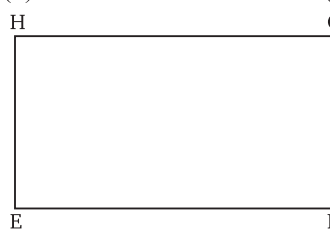


6. (a) $\overline{PQ}, \overline{QS}, \overline{SR}, \overline{QR}, \overline{PS}$ and \overline{PR} are six line segments.
 (b) $\angle PQR, \angle PRQ, \angle QPS, \angle QPR, \angle SPR, \angle PSQ$ and $\angle PSR$ are seven angles.
 7. $\triangle PQR$ and $\triangle PSR$ have $\angle R$ as common.

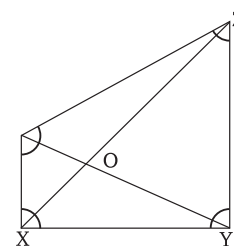
Exercise 9.5

1. (1) Surface of the door, (2) Top of the table,
 (3) Room floor (4) A paper sheet.

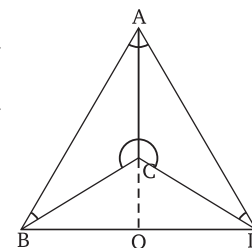
- 2.



- (a) $(EF, FG), (FG, GH), (GH, HE)$ and (HE, EF) are the pairs of adjacent sides.
 (b) (EF, HG) and (HE, GF) are the pairs of opposite sides.
 (c) $(\angle E, \angle F); (\angle F, \angle G); (\angle G, \angle H)$ and $(\angle H, \angle E)$ are the pairs of adjacent angles.
 (d) $(\angle E, \angle G)$ and $(\angle F, \angle H)$ are pair of opposite angles.
 3. Convex quadrilateral has each angles less than 180° . Also, the point of intersecting of diagonals of a convex quadrilateral lies inside the quadrilateral.



Concave quadrilateral has one of the angles is more than 180° but less than 360° . Also, the point of intersection of diagonals lies outside the quadrilateral.



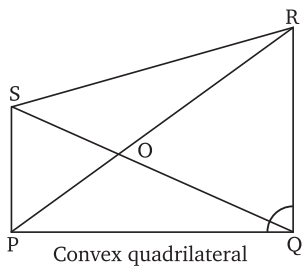
4. (a) K, L and M are interior points of quadrilateral $ABCD$.
 (b) X, Y, W and Z are exterior points of quadrilateral $ABCD$.
 (c) Points A, B, C, D, P, Q, R and S are lie on the quadrilateral $ABCD$.
 (d) Points $K, L, M, A, B, C, D, R, Q, P$ and S lie on the quadrilateral region of quadrilateral $ABCD$.
 5. (a) and (c) are convex quadrilateral figure.
 (b) and (d) are concave quadrilateral figure.
 6. The given figure $PQRS$ is not a quadrilateral because it is not bounded four sides or as it not a simple close figure/curve.

7. If a quadrilateral in which the measure of one of the angles is more than 180° but less than 360° is called a concave quadrilateral.

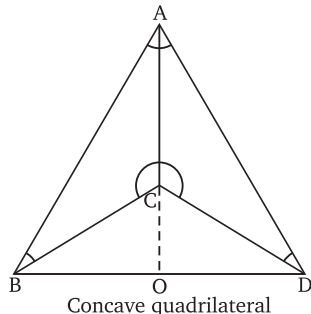
$$\therefore 185^\circ < 180^\circ$$

So, it is a concave quadrilateral.

8.



Convex quadrilateral



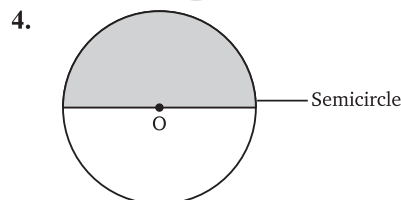
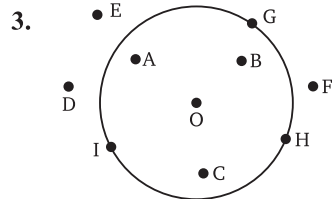
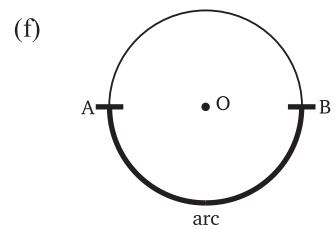
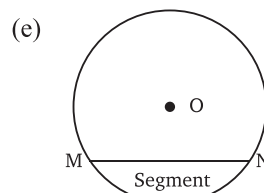
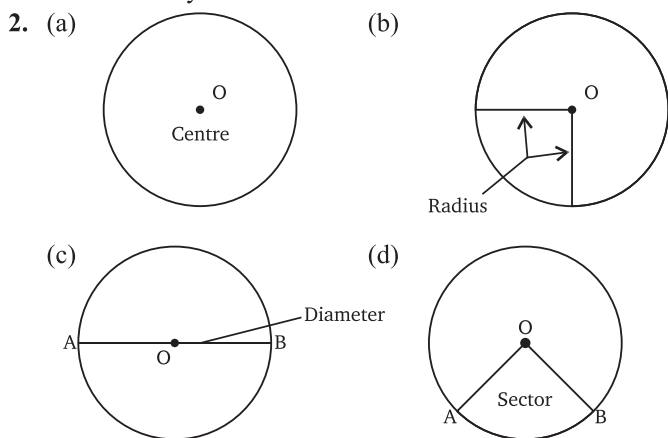
Concave quadrilateral

Mental Maths

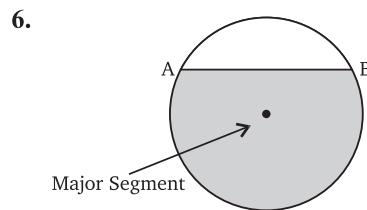
- The centre of the circle = O
- Three radii = OA, OC and OE .
- The diameter = AC
- Two chords = AC and DE
- Two points in the interior = O and P
- A point in the exterior = B or Q .
- Two sectors = EOC and COA .
- A segment = $E \times D$

Exercise 9.6

- Chord** : A line segment having its end points on the circle is called a chord of the circle.
 - Diameter** : The diameter of a circle is line segment having its end points on the circle and passing through its centre. Diameter is denoted by d .
 - Sector** : A region in the interior of a circle, formed by an arc and the two radii joining the end points of the arc, is called a sector of the circle. A pizza slice represents a sector of the circular pizza.
 - Segment** : A chord of a circle divides the circular region into two parts called segments of the circle.
 - A diameter divides the circle into two equal parts called semicircles.
 - Circumference** : The perimeter of a circle is known as its circumference. In other words, the length of the boundary of a circle is called its circumference.



- O is the centre of the circle.
 - OD, OB, OC and OA are four radii of the circle.
 - AB and DC are two diameters of the circle.
 - AB, DC, AD and BC are four chords of the circle.
 - Points A, B, D, C, F, O, R, Q and P are in the circular region.
 - $AOCFA$ is the sector of the circle.
 - \widehat{AFC} is the arc of the circle.



- Yes, every diameter of a circle is also a chord.
 - No, every chord of a circle is not a diameter.
 - Yes, the diameter is a part of the semicircle.
 - Yes, the centre is a part of the circle.
 - Yes, the radius is a part of the circle.

8. We know that,

Diameter of a circle = $2 \times$ radius of the circle.

- $d = 2r \therefore r = 4 \text{ cm}$
 - $\therefore r = 5 \text{ cm}$
 - $\therefore d = 2 \times 4 \text{ cm} = 8 \text{ cm}$
 - $\therefore d = 2 \times 5 \text{ cm} = 10 \text{ cm}$
 - $\therefore r = 7.5 \text{ cm}$
 - $\therefore r = 14.5 \text{ cm}$
 - $\therefore d = 2 \times 7.5 \text{ cm} = 15 \text{ cm}$
 - $\therefore d = 2 \times 14.5 \text{ cm} = 29 \text{ cm}$
- $\therefore d = 6 \text{ cm}$
 - $\therefore d = 8 \text{ cm}$
 - $\therefore r = \frac{d}{2} = \frac{6}{2} = 3 \text{ cm}$
 - $\therefore r = \frac{d}{2} = \frac{8}{2} = 4 \text{ cm}$
 - $\therefore d = 18 \text{ cm}$
 - $\therefore d = 8.5 \text{ cm}$
 - $\therefore r = \frac{d}{2} = \frac{18}{2} = 9 \text{ cm}$
 - $\therefore r = \frac{d}{2} = \frac{8.5}{2} = 4.25 \text{ cm}$

MCQ's

1. a 2. a 3. b 4. c 5. a 6. b 7. a 8. a 9. c 10. a

NEP Development of Traditional Knowledge

- (a) Number of triangles = 13 (b) Number of triangles = 10

Exercise 10.1

1. (a) Perimeter of triangle = The sum of three sides
 $= 12 \text{ cm} + 12 \text{ cm} + 15 \text{ cm} = \mathbf{39 \text{ cm}}$.
- (b) Perimeter of polygon = The sum of the sides
 $= 10 \text{ cm} + 10 \text{ cm} + 10 \text{ cm} + 7 \text{ cm} + 7 \text{ cm} + 10 \text{ cm}$
 $+ 10 \text{ cm} + 12 \text{ cm} = \mathbf{76 \text{ cm}}$
- (c) Perimeter of regular hexagon = $6 \times$ sides
 $= 6 \times 6 \text{ cm} = \mathbf{36 \text{ cm}}$
- (d) Perimeter of Rhombus = $4 \times$ sides
 $= 4 \times 10 \text{ cm}$
 $= \mathbf{40 \text{ cm}}$
- (e) Perimeter of quadrilateral = The sum of four sides
 $= 35 \text{ cm} + 40 \text{ cm} + 25 \text{ cm} + 50 \text{ cm}$
 $= \mathbf{150 \text{ cm}}$
- (f) Perimeter of polygons
 = The sum of different all sides
 $= 4 \text{ cm} + 1 \text{ cm} + 3 \text{ cm} + 2 \text{ cm} + 3 \text{ cm} + 4 \text{ cm} + 1 \text{ cm}$
 $+ 3 \text{ cm} + 2 \text{ cm} + 3 \text{ cm} + 4 \text{ cm} + 1 \text{ cm} + 3 \text{ cm} + 2 \text{ cm}$
 $+ 3 \text{ cm} + 4 \text{ cm} + 1 \text{ cm} + 3 \text{ cm} + 2 \text{ cm} + 3 \text{ cm} = \mathbf{52 \text{ cm}}$
2. The perimeter of triangle = 75 cm
 Two of the sides = 20 cm and 30 cm
 Third side = ?
 \therefore Perimeter of triangle = The sum of three sides
 $\therefore 75 \text{ cm} = 20 \text{ cm} + 30 \text{ cm} + \text{Third side}$
 Third side = $(75 - 20 - 30) \text{ cm} = 25 \text{ cm}$.
3. The length of rectangular park = 25 m
 The breadth of rectangular park = 10 m
 \therefore Distance covered by Rahul in 4 rounds
 $= 4 \times$ Perimeter of rectangular park.
 $= 4(25 \times 2 + 10 \times 2) \text{ m}$
 $= 4(50 + 20) \text{ m}$
 $= 4 \times 70 \text{ m}$
 $= 280 \text{ m}$
4. The length of photograph = 45 cm
 The breadth of photograph = 32 cm
 \therefore The length of wooden strip = Perimeter
 $= 2(45 \text{ cm} + 32 \text{ cm})$
 $= 2 \times 77 \text{ cm} = 154 \text{ cm}$
 \therefore the cost of 1 cm frame = ₹ 12
 So, the cost of 154 cm frame = ₹ $12 \times 154 = ₹ 1848$
5. The total length of wire = 600 cm
 (a) Perimeter of an equilateral triangle = $3 \times$ sides
 $600 \text{ cm} = 3 \times \text{side}$
 $\text{side} = \frac{600 \text{ cm}}{3} = 200 \text{ cm}$
 $\text{side} = 200 \text{ cm}$
 So, the side of equilateral triangle is 200 cm.
- (b) Perimeter of a square = The total length of wire
 $4 \times \text{side} = 600 \text{ cm}$
 $\text{side} = \frac{600 \text{ cm}}{4} = 150 \text{ cm}$
 So, the side of equilateral triangle is 150 cm.
- (c) Perimeter of a regular pentagon = The total length of wire
 $5 \times \text{side} = 600 \text{ cm}$
 $\text{side} = \frac{600 \text{ cm}}{5} = 120 \text{ cm}$
 So, the side of regular pentagon is 120 cm.
- (d) Perimeter of regular hexagon = The total length of wire
 $6 \times \text{sides} = 600 \text{ cm}$
 $\text{side} = \frac{600 \text{ cm}}{6} = 100 \text{ cm}$
 $\text{side} = 100 \text{ cm}$
 So, the side of regular hexagon is 100 cm.
- (e) Perimeter of regular decagon = The total length of wire
 $10 \times \text{side} = 600 \text{ cm}$
 $\text{side} = \frac{600}{10} \text{ cm} = 60 \text{ cm}$
 So, the side of regular decagon is 60 cm.
6. The length of a square park = 300 m
 \therefore perimeter of a square = $4 \times$ side
 \therefore perimeter of square park = $4 \times 300 \text{ m} = 1200 \text{ m}$
 Cost of fencing = perimeter \times cost per meter
 $= ₹ 15 \times 1200 = ₹ 18000$.
7. The length of a rectangular park = 300 m
 and the breadth of a park = 200 m
 \therefore Distance covered by Karan in four rounds
 $= 4 \times$ Distance walked in 1 round
 $= 4 \times$ perimeter of the rectangular park
 $= 4[2(300 + 200) \text{ m}]$
 $= 4[2 \times 500] \text{ m}$
 $= 4 \times 1000 \text{ m} = 4000 \text{ m}$
 Now, No. of rounds = $\frac{\text{Total distance covered by him}}{\text{Perimeter of rectangular park}}$
 $= \frac{9 \text{ km}}{2(300 + 200) \text{ m}} = \frac{9 \times 1000 \text{ m}}{2 \times 500 \text{ m}}$
 $= \frac{9000}{1000} = 9 \text{ rounds}$.
8. Total distance around a rectangular field = 600 m
 The length of field = 35 m
 and the breadth of field = 15 m
 No. of rounds = $\frac{600 \text{ m}}{2(35 + 15) \text{ m}} = \frac{600 \text{ m}}{100 \text{ m}} = 6 \text{ times}$

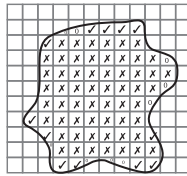
9. The length of a carpet = 6 m 20 cm
 The breadth of a carpet = 4 m 40 cm
 \therefore Perimeter of a carpet = $2(6.20 + 4.40)$ m
 $= 2 \times 10.60$ m
 $= 21.20$ m or = 2120 cm

Cost of ribbon = Perimeter \times Cost per meter
 $= ₹ 15 \times 21.20 = ₹ 318$

10. The distance run by Dinesh
 $= 4 \times 90$ m = 360 m
 The distance run by Naresh = $2(120 + 80)$ m
 $= 2 \times 200$ m = 400 m
 The difference = 400 m - 360 m
 $= 40$ m
 So, Naresh covered more distance by 40 m.

Exercise 10.2

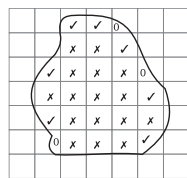
1. (a) The required area of figure
 $=$ No. of (X) square
 $+ \text{No. of } (\checkmark)$ square
 $+ \frac{1}{2} \times \text{No. of } (0)$ squares.
 $= 58 + 12 + \frac{1}{2} \times 6$
 $= (70 + 3)$ sq. cm = 73 sq. cm (app)



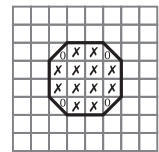
- (b) The required area of figure
 $=$ No. of (X) square
 $+ \text{No. of } (\checkmark)$ square
 $+ \frac{1}{2} \times \text{No. of } (0)$ square
 $= 10 + 27 + \frac{1}{2} \times 2$
 $= (37 + 1)$ sq. cm = 38 sq. cm (app)



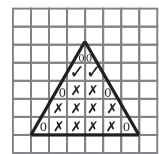
- (c) The required area of figure
 $=$ No. of (X) square
 $+ \text{No. of } (\checkmark)$ square
 $+ \frac{1}{2} \times \text{No. of } (0)$ square.
 $= 15 + 7 + \frac{1}{2} \times 3$
 $= 22 + 1\frac{1}{2}$
 $= 23\frac{1}{2}$ sq. cm (app)



2. (a) The area of figure
 $=$ No. of (X) square
 $+ \text{No. of } (\checkmark)$ square
 $+ \frac{1}{2} \times \text{No. of } (0)$ square.
 $= 12 + 0 + \frac{1}{2} \times 4$
 $= 12 + 2 = 14$ sq. cm

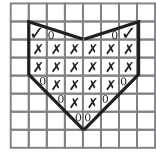


- (b) The area of figure
 $=$ No. of (X) square
 $+ \text{No. of } (\checkmark)$ square
 $+ \frac{1}{2} \times \text{No. of } (0)$ square

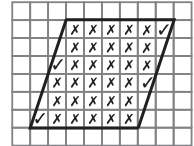


$$= 10 + 4 + \frac{1}{2} \times 2 = (10 + 4 + 1)$$
 sq. cm
 $= 15$ sq. cm

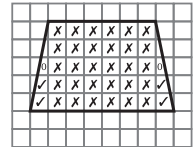
- (c) The area of figure
 $=$ No. of (X) square
 $+ \text{No. of } (\checkmark)$ square
 $+ \frac{1}{2} \times \text{No. of } (0)$ square.
 $= 18 + 2 + \frac{1}{2} \times 8$
 $= (18 + 2 + 4)$ sq. cm = 24 sq. cm



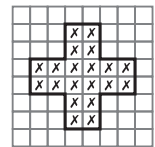
- (d) The area of figure
 $=$ No. of (X) square
 $+ \text{No. of } (\checkmark)$ square
 $+ \frac{1}{2} \times \text{No. of } (0)$ squares
 $= 30 + 4 + \frac{1}{2} \times 4$
 $= (34 + 2)$ sq. cm
 $= 34$ sq. cm



- (e) The area of figure
 $=$ No. of (X) square
 $+ \text{No. of } (\checkmark)$ square
 $+ \frac{1}{2} \times \text{No. of } (0)$ square
 $= 30 + 4 + \frac{1}{2} \times 2$
 $= (34 + 1)$ sq. cm = 35 sq. cm



- (f) The area of figure
 $=$ No. of (X) square
 $+ \text{No. of } (\checkmark)$ square
 $+ \frac{1}{2} \times \text{No. of } (0)$ square
 $= 20 + 0 + \frac{1}{2} \times 0$
 $= 20$ sq. cm



Exercise 10.3

1. (a) The given, $l = 16$ cm, $b = 12$ cm
 \therefore the area of rectangle = $l \times b$
 \therefore The area of rectangle = $16 \times 12 = 192$ cm²
 (b) The given, $l = 11.2$ m, $b = 9$ m
 \therefore the area of rectangle = $l \times b = 11.2 \times 9 = 100.8$ m²
 (c) The given, $l = 25$ cm, $b = 16$ cm
 \therefore The area of rectangle = $l \times b = 25 \times 16 = 400$ cm²
 2. \therefore the area of a square = (side)²
 (a) The area of square = $(4.50)^2 = 20.25$ m²
 (b) The given, side = 25 cm
 \therefore The area of square = (side)² = $(25)^2 = 625$ cm²
 (c) The given, side = $10\frac{1}{2}$ m = 10.5 m
 \therefore The area of square = (side)² = $(10.5)^2 = 110.25$ m²
 3. (a) The given, $l = 20$ cm, $b = 15$ cm
 \therefore The area of rectangle = $l \times b = 20 \times 15 = 300$ cm²

(b) The given, side = 22 cm

$$\therefore \text{The area of square} = (\text{side})^2 = (22 \text{ cm})^2 = 484 \text{ cm}^2$$

So, the rectangle has smaller area.

4. The length of a room = 6 m

$$\therefore \text{The area of square room} = (\text{length})^2 \\ = (6 \text{ m})^2 = 36 \text{ m}^2$$

$$\therefore \text{The cost of flooring the square room} = ₹ 150 \times 36 \\ = ₹ 5400$$

5. The given, side of a square = 16 cm

$$\therefore \text{The area of square} = (16)^2 = 256 \text{ cm}^2$$

If the area of rectangle is the same of the a square.

$$\therefore \text{The breadth of the rectangle} = \frac{\text{The area of square}}{\text{length of rectangle}} \\ = \frac{256}{32} = 8 \text{ cm}$$

Hence, the breadth of the rectangle is 8 cm.

6. The length of rectangular plot = 400 m

The breadth of rectangular plot = 200 m

$$\therefore \text{The area of rectangular plot} = l \times b \\ = 400 \text{ m} \times 200 \text{ m} \\ = 80000 \text{ m}^2$$

$$\therefore \text{The cost of tiling the rectangular plot} = ₹ \frac{12}{100} \times 80000 \\ = ₹ 12 \times 800 \\ = ₹ 9600$$

$$7. \text{ The area of room} = 300 \text{ m} \times 200 \text{ m} \\ = 60000 \text{ m}^2$$

\therefore Side of a square carpet = 180 m

$$\therefore \text{The area of square carpet} = 180 \text{ m} \times 180 \text{ m} \\ = 32400 \text{ m}^2$$

$$\text{So, the area of floor which is not carpeted} \\ = 60000 \text{ m}^2 - 32400 \text{ m}^2 \\ = 27600 \text{ m}^2$$

8. The length of rectangular park = 500 m

The breadth of rectangular park = 300 m

$$\therefore \text{The area of rectangular park} = 500 \times 300 \\ = 150000 \text{ m}^2$$

\therefore Side of a square = 50 m

$$\therefore \text{The area of one flower bed} = (50)^2 \text{ m}^2 \\ = 2500 \text{ m}^2$$

$$\therefore \text{The area of five flower bed} = 5 \times 2500 \text{ m}^2 = 12500 \text{ m}^2$$

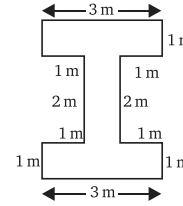
$$\text{Hence, the remaining area of the park} \\ = \text{Area of the rectangular park} - \text{Area of five flowerbed} \\ = 150000 \text{ m}^2 - 12500 \text{ m}^2 \\ = 137500 \text{ m}^2.$$

$$9. \text{ The area of a file} = 20 \times 20 \text{ cm}^2 = 400 \text{ cm}^2$$

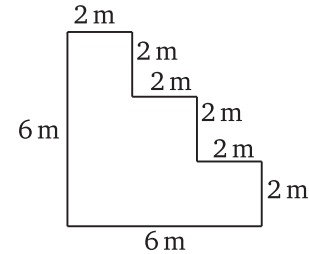
$$\text{The area of a square bathroom} = 300 \times 300 \text{ cm}^2 \\ = 90000 \text{ cm}^2$$

$$\therefore \text{No. of required tile} = \frac{\text{The area of a square bathroom}}{\text{The area of a tile}} \\ = \frac{90000}{400} = 225 \text{ tiles.}$$

$$10. (a) \text{ The area of figure} = 2[3 \times 1] + 2 \times 1 = 6 + 2 = 8 \text{ m}^2$$

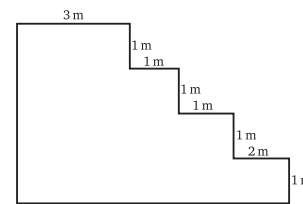


(b) The area of figure



$$= [2 \times 2] \text{ m}^2 + [4 \times 2] \text{ m}^2 + [6 \times 2] \text{ m}^2 \\ = 4 \text{ m}^2 + 8 \text{ m}^2 + 12 \text{ m}^2 = 24 \text{ m}^2$$

(c) The area of figure



$$= 3 \times 1 \text{ m}^2 + 4 \times 1 \text{ m}^2 + 5 \times 1 \text{ m}^2 + 7 \times 1 \text{ m}^2 \\ = (3 + 4 + 5 + 7) \text{ m}^2 = 19 \text{ m}^2$$

MCQ's

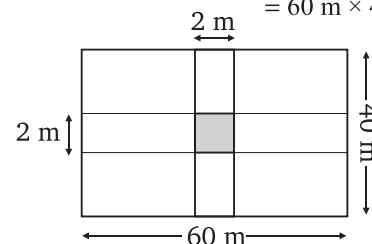
1. c 2. b 3. a 4. b 5. b 6. c 7. a

NEP Multiple Intelligence

Length of rectangular park = 60 m

And, Breadth of rectangular park = 40 m

$$\therefore \text{Area of the rectangular park} = l \times b \\ = 60 \text{ m} \times 40 \text{ m} = 2400 \text{ m}^2$$



Width of path = 2 m

$$\therefore \text{Area of the path} = (60 \times 2) \text{ m}^2 + (40 \times 2) \text{ m}^2 - (2 \times 2) \text{ m}^2 \\ = (120 + 80 - 4) \text{ m}^2 \\ = 196 \text{ m}^2$$

$$\text{Hence, the area of the remaining part of the park} \\ = \text{Total area of rectangular park} - \text{Area of path} \\ = 2400 \text{ m}^2 - 196 \text{ m}^2 = 2204 \text{ m}^2$$

HOTS

Length of a floor = 6 m

And breadth of floor = 5 m

$$\therefore \text{Area of floor} = 6 \text{ m} \times 5 \text{ m} = 30 \text{ m}^2$$

Side of square carpet = 4 m

$$\begin{aligned} \therefore \text{Area of square carpet} &= (\text{side})^2 \\ &= (4 \text{ m})^2 = 16 \text{ m}^2 \end{aligned}$$

$$\therefore \text{Remaining Area of floor} = 30 \text{ m}^2 - 16 \text{ m}^2 = 14 \text{ m}^2$$

Hence, the area of the floor that is not carpeted is 14 m^2 .

Chapter

11

Data Handling

Exercise 11.1

1. The required frequency distribution table is :

Marks	Tally Marks	Frequency
1		1
2		3
3		5
4		8
5		6
6		4
7		2
8		1
	Total	30

- (a) 13 students have scored 5 or more marks.
 (b) 23 students have scored 5 or less marks.
 (c) 4 marks is received by the maximum number of students.

2. Descending order = 5, 5, 5, 5, 5, 4, 4, 4, 4, 4, 4, 4, 4, 3, 3, 3, 3, 3, 2, 2, 2, 2, 2, 1, 1, 1, 0, 0, 0.

The maximum number of children in a family is 5.

The minimum number of children in a family is zero.

Number of families with no child is 3.

3. The required frequency distribution table is :

Number	Tally Marks	Frequency
1		7
2		7
3		8
4		5
5		10
6		8
	Total	45

- (a) number 5 appeared maximum number of times.

- (b) number 4 appeared minimum number of times.
 (c) 6 had appeared 8 times.

4. The required frequency distribution table is :

Marks	Tally Marks	Frequency
1		2
2		3
3		3
4		7
5		6
6		7
7		5
8		4
9		3
	Total	40

- (a) 12 students obtained 7 or more marks.
 (b) 8 students obtained less than 4 marks.







5. The required frequency distribution table is :

Expenses (₹)	Tally Marks	Frequency
62		2
64		3
66		3
68		2
70		6
72		2
74		2
76		2
78		1
80		2
	Total	25

- (a) ₹ 70 was spent by maximum number of students.
- (b) ₹ 78 was spent by minimum number of students.
- (c) 15 students spent ₹ 70 or more.


Exercise 11.2

1. We can express this information by a pictograph, as under :

July	
Aug	
Sep	
Oct	
Nov	
Dec	




One  represents 5 kg of rice.

2. We can represent this information by a pictograph, as under :

Monday	
Tuesday	
Wednesday	
Thursday	
Friday	
Saturday	





One  represents 3 books.

3. We can express this information by a pictograph, as under :

Monday	
Tuesday	
Wednesday	



One  represents 50 dolls.

4. We can express this information by a pictograph, as under :

Elephants	
Tigers	
Lions	
Bears	






One picture of animals represents 5 animals.

5. We can Represent this information a pictograph, as under :

2009	
2010	
2011	
2012	
2013	
2014	

One  represents 5,000 bicycles.

6. We can express this information by a pictograph, as under :

India	
Pakistan	
S.Koria	
China	
England	




One  represents 5,00,000 people.

7. We can represent this information by a pictograph, as under ;

2010	
2011	
2012	
2013	
2014	

One  represents 500 houses.

8. We can represent this information by a pictograph, as under :

Rose	
Sunflower	
Marigold	

One  represents 25 flowers.

Exercise 11.3

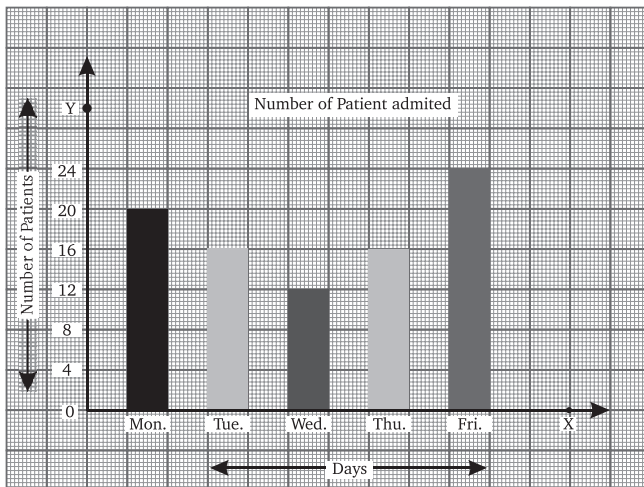
1.

	Name of place	No. of tourists
1.	Kashmir	$10 \times 200 = 2000$
2.	Golden Temple	$9 \times 200 = 1800$
3.	Silliguri	$8 \times 200 = 1600$
4.	Taj Mahal	$12 \times 200 = 2400$

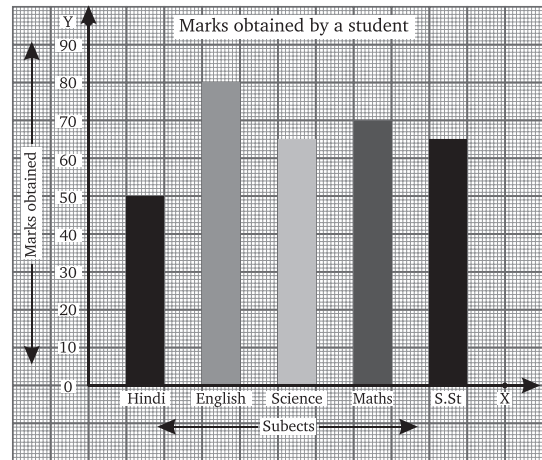
2. (a) He sold 100 CFLS altogether in 6 days.
 (b) First day he sold maximum number of CFLS on first day.
 (c) Two days (third and fourth day) he sold equal number of CFLS.
 (d) He sold 14 CFLS on the sixth day.
3. (a) There are 450 apples trees in the orchard.
 (b) Papaya trees are minimum.
 (c) Orange trees are maximum.
 (d) 250 orange trees are more than papaya trees.
 (e) The total number of trees in the orchard is 1850.
4. (a) 3250 computers were produced in the factory during the year.
 (b) The production of computers was least on June month.
 (c) 200 less computers were produced on March than on January.
 (d) The production of computers was equal on February and July.
5. (a) There are 4-Guppy, 6-Algae eater, 6-Angelfish, 8-Neon and 4-zebra fish in the aquarium together.
 (b) There are 4 neons more than guppies.
 (c) There are 2 angle fishes more than zebra fishes.
 (d) The total number of fishes is 28 in the aquarium.
6. (a) The phone seller sell the maximum number of mobile phone on Saturday.
 (b) 20 Android mobile phone were sold on Wednesday.
 (c) No mobile phone was sold on Friday.
 (d) On Sunday and Thursday.
 (e) 240 Android mobiles were sold during the week.

Exercise 11.4

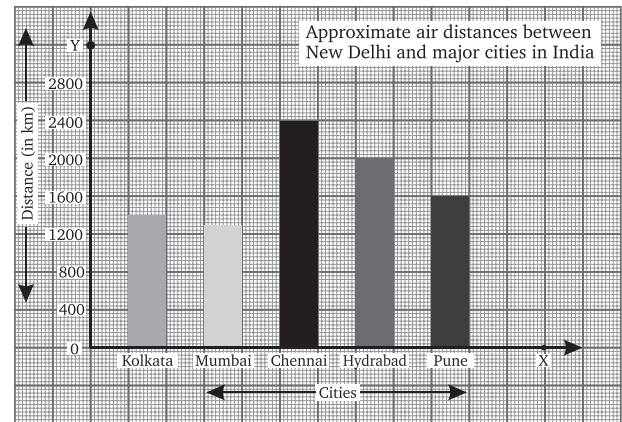
1.



2.



3.



4. (a) 68 matches were played in all.
 (b) 4 goals were scored in 12 matches.
 (c) No goal was scored in 12 matches.

MCQ's

1. b 2. b 3. c 4. a 5. c 6. c 7. a 8. a 9. b

HOTS

Do it yourself.

NEP Life Skills

