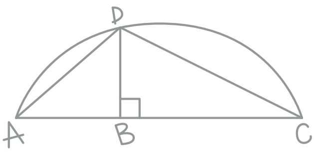
Carvaan

As per NCF 2023

Mathematics



Writer:
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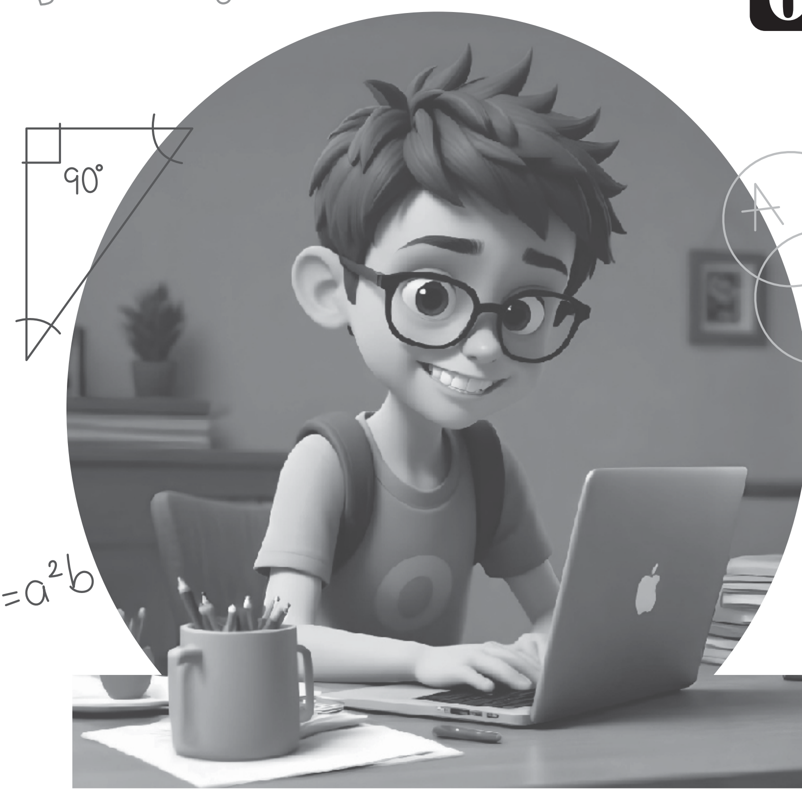
M. Sc. (Mathematics)

Help-kit

6-8



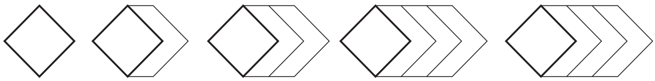
$x+y=a^2b$

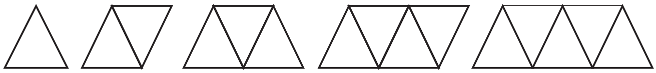
MASTERMIND

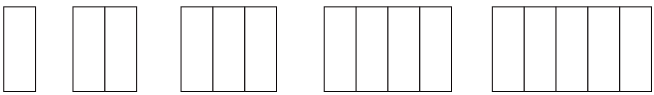
Chapter

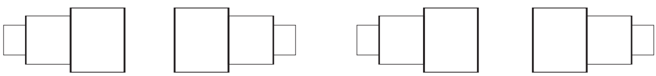
1 Patterns in Mathematics

Exercise 1.1

1. (a) 

(b) 

(c) 

(d) 

2. (a) 2, 4, 6, 8, 10, 12, 14, 16, 18
+2 +2 +2 +2 +2 +2 +2 +2

(b) 3, 6, 9, 12, 15, 18, 21, 24
+3 +3 +3 +3 +3 +3 +3

(c) 6, 10, 14, 18, 22, 26, 30, 34
+4 +4 +4 +4 +4 +4 +4

(d) 3, 8, 13, 18, 23, 28, 33, 38
+5 +5 +5 +5 +5 +5 +5

(e) 4, 13, 22, 31, 40, 49, 58, 67
+9 +9 +9 +9 +9 +9 +9

(f) 28, 24, 20, 16, 12, 8, 4, 0
–4 –4 –4 –4 –4 –4 –4

(g) 1, 1, 2, 3, 5, 8, 13, 21, 34, 55

Differences: +0, +1, +1, +2, +3, +5, +8, +13, +21

(Add previous number)

(h) 1, 4, 9, 16, 25, 36, 49, 64, 81

$(1)^2$ $(2)^2$ $(3)^2$ $(4)^2$ $(5)^2$ $(6)^2$ $(7)^2$ $(8)^2$ $(9)^2$

3. (a) $\frac{1}{4}$ $\frac{1}{2}$ $\frac{3}{4}$ 1 $\frac{5}{4}$ $\frac{3}{2}$ Pattern;

A number = Previous number + $\frac{1}{4}$

(b) $2\frac{1}{2}$ 2 $1\frac{1}{2}$ 1 $\frac{1}{2}$ 0 Pattern;

A number = Previous number − $\frac{1}{2}$

(c) $\frac{7}{243}$ $\frac{7}{81}$ $\frac{7}{27}$ $\frac{7}{9}$ $\frac{7}{3}$ 7 Pattern;

A number = Previous number × 3

(d) .001 .01 .1 1 10 100 Pattern;

A number = Previous number × 10

(e) 990 99 9.9 0.99 0.099 0.0099 Pattern;

A number = Previous number ÷ 10

4. (a) 10, 19, 30, 43, 58, 75, 94

Differences: +9, +11, +13, +15, +17, +19

(b) 4, 14, 28, 46, 68, 94, 124

Differences: +10, +14, +18, +22, +26, +30

(c) 6, 22, 46, 78, 118, 166, 222

Differences: +16, +24, +32, +40, +48, +56

5. $1+3=4=2\times2=4$

$1+3+5=9=3\times3=9$

(a) $1+3+5+7=16=\mathbf{4\times4=16}$

(b) $1+3+5+7+9=25=\mathbf{5\times5=25}$

(c) $1+3+5+7+9+11=36=\mathbf{6\times6=36}$

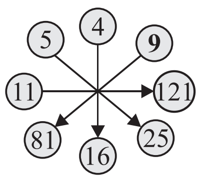
6. (a) $(5\times5)-(4\times4)=\mathbf{9}$ (b) $(6\times6)-(5\times5)=\mathbf{11}$

(c) $(9\times9)-(8\times8)=\mathbf{17}$

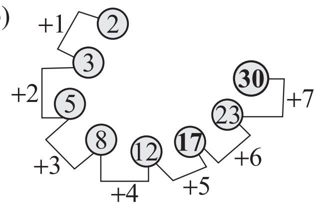
7. (a) $45\times45=\mathbf{2025}$ (b) $55\times55=\mathbf{3025}$

(c) $65\times65=\mathbf{4225}$ (d) $85\times85=\mathbf{7225}$

8. (a)



(b)



9. (a) $2\times11=22$

$22\times11=242$

$222\times11=2442$

$2222\times11=24442$

$22222\times11=\mathbf{244442}$

$\mathbf{222222}\times11=\mathbf{2444442}$

$\mathbf{2222222\times11=24444442}$

(b) $99\times11=1089$

$999\times11=10989$

$9999\times11=109989$

$99999\times11=1099989$

$999999\times11=\mathbf{10999989}$

$\mathbf{9999999}\times11=\mathbf{109999989}$

$\mathbf{99999999\times11=1099999989}$

(c) $88\times11=968$

$888\times11=9768$

$8888\times11=97768$

$88888\times11=977768$

$888888\times11=\mathbf{9777768}$

$\mathbf{8888888}\times11=\mathbf{97777768}$

$\mathbf{88888888\times11=977777768}$

(d) $9\times1-1=8$

$9\times21-1=188$

$9\times321-1=2888$

$9\times4321-1=38888$

$9\times54321-1=\mathbf{488888}$

$9\times\mathbf{654321}-1=\mathbf{5888888}$

$9\times\mathbf{7654321}-1=\mathbf{68888888}$

(e)

$(3+1)\times 2=8$

$(6+1)\times 2=14$

$(9+1)\times 2=20$

$(12+1)\times 2=26$

$(\mathbf{15}+1)\times 2=\mathbf{32}$

$(\mathbf{18}+\mathbf{1})\times \mathbf{2}=\mathbf{38}$

(f)

$3\times 4=12$

$33\times 34=1122$

$333\times 334=111222$

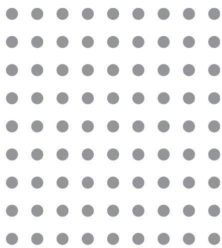
$3333\times 3334=\mathbf{11112222}$

$33333\times 33334=\mathbf{1111122222}$

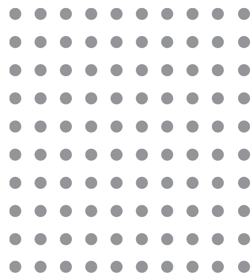
$\mathbf{333333}\times \mathbf{333334}=\mathbf{111111222222}$

10. $(1)^2=1,\ 2^2=4,\ 3^2=9,\ 4^2=16,\ 5^2=25,\ 6^2=36,\ 7^2=49,$
$8^2=64,\ 9^2=81,\ 10^2=100$

11. (a)



(b)



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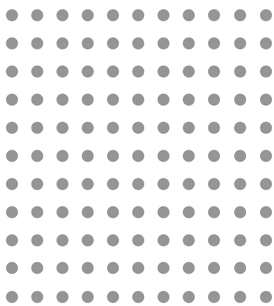
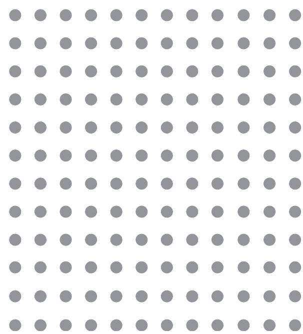


(d)



12. (a) $1+3+5+7=16$

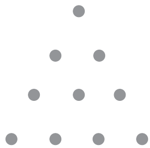
(b) $1+3+5+7+9=25$

(c) $1+3+5+7+9+11=36$

(d) $1+3+5+7+9+11+13=49$

13. 1, 3, 6, 10, 15, 21, 28, 36, 45, 55

14. (a)



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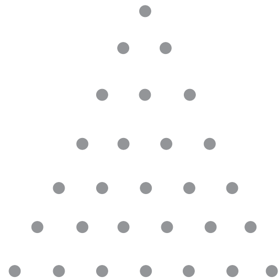
(b)



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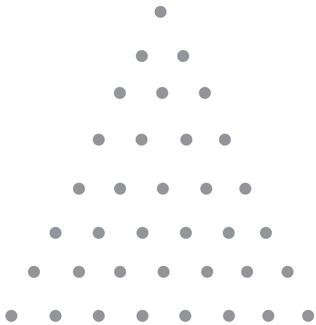
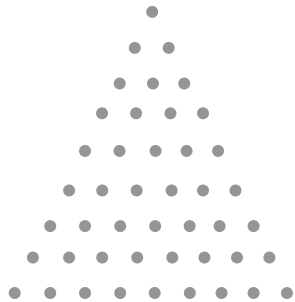
(c)



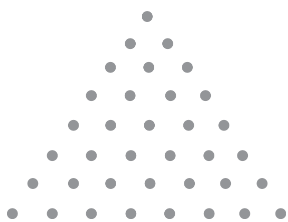
36

(d)



45

15. (a) 8^{th} triangular number



$$\text{Number of dots} = \frac{8 \times (8+1)}{2}$$

$$= 4 \times 9$$

$$= 36$$

(b) 12^{th} triangular number

$$\text{Number of dots} = \frac{12\times(12+1)}{2}$$

$$= \frac{12\times 13}{2} = 6\times 13 = 78$$

(c) 16^{th} triangular number

$$\text{Number of dots} = \frac{16\times(16+1)}{2}$$

$$= \frac{16\times 17}{2} = 8\times 17 = 136$$

(d) 19^{th} triangular number

Number of dots $= \dfrac{19\times(19+1)}{2}$

$= \dfrac{19\times 20}{2} = 19\times 10 = 190$

16. (a) The sum of numbers in row 1 = **1**

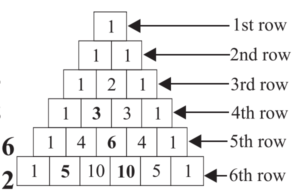
(b) The sum of numbers in row 2 = **2**

(c) The sum of numbers in row 3 = **4**

(d) The sum of numbers in row 4 = **8**

(e) The sum of numbers in row 5 = **16**

(f) The sum of numbers in row 6 = **32**



Exercise 1.2

1. (a)

2	**7**	6
9	5	**1**
4	**3**	8

(b)

4	11	**6**
9	7	**5**
8	**3**	10

(c)

17	**6**	4	**11**
3	12	**14**	9
10	**5**	7	**16**
8	15	**13**	2

(d)

22	29	6	13	20
28	**10**	**12**	19	**21**
9	11	18	**25**	27
15	17	24	26	**8**
16	**23**	30	7	14

2. (a) 75628×5

$= 75628 \times \frac{10}{2}$

$= \frac{756280}{2} = 378140$

(b) 5338×1001

$= 5338 \times (1000 + 1)$

$= 5338 \times 1000 + 5338 \times 1$

$= 5338000 + 5338$

$= 5343338$

(c) 2628×125

$= 2628 \times \frac{1000}{8}$

$= \frac{2628000}{8} = 328500$

(d) 2958×15

$= 2958 \times \frac{30}{2}$

$= \frac{88740}{2} = 44370$

3. (a) $899 + 99$

$= 899 + (100 - 1)$

$= 899 + 100 - 1$

$= 999 - 1 = 998$

(b) $777 + 999$

$= 777 + 1000 - 1$

$= 1777 - 1$

$= 1776$

(c) $1465 - 999$

$= 1465 - 1000 + 1$

$= 465 + 1 = 466$

(d) $1982 - 99$

$= 1982 - 100 + 1$

$= 1882 + 1 = 1883$

(e) 1509×99

$= 1509 \times (100 - 1)$

$= 1509 \times 100 - 1509 \times 1$

$= 150900 - 1509$

$= 149391$

(f) 73949×9

$= 73949 \times (10 - 1)$

$= 73949 \times 10 - 73949$

$= 739490 - 73949$

$= 665541$

Mental Maths :

(a)

$$1 \times 9 + 2 = 11$$
$$12 \times 9 + 3 = 111$$
$$123 \times 9 + 4 = 1111$$
$$1234 \times 9 + 5 = 11111$$
$$\mathbf{12345} \times 9 + 6 = \mathbf{111111}$$
$$\mathbf{123456} \times 9 + \mathbf{7} = \mathbf{1111111}$$

(b)

$$12 - 1 = 11$$
$$123 - 12 = 111$$
$$1234 - 123 = 1111$$
$$12345 - 1234 = 11111$$
$$\mathbf{123456} - 12345 = \mathbf{111111}$$
$$\mathbf{1234567} - \mathbf{123456} = 1111111$$

(c)

110				
54	56			
30	24	32		
15	15	9	**23**	
5	10	5	**4**	**17**

Chapter

2 Lines and Angles

1. We know that, the sum of the measure of an angle and its complement is 90°.

(a) ∴ Complement of 42° = 90°–42° = 48°

(b) ∴ Complement of 65° = 90°–65° = 25°

(c) ∴ Complement of 39° = 90°–39° = 51°

(d) ∴ Complement of 51° = 90°–51° = 39°

2. We know that, the sum of the measure of an angle and its supplement is 180°.

(a) ∴ Supplement of 105° = 180°–105° = 75°

(b) ∴ Supplement of 87° = 180°–87° = 93°

(c) ∴ Supplement of 135° = 180°–135° = 45°

(d) ∴ Supplement of 154° = 180°–154° = 26°

3. (a) Sum of 159° and 21° = 159°+21° = 180°

∴ These are supplementary angles

(b) Sum of 29° and 61° = 29°+ 61° = 90°

$\therefore$ These are supplementary angles

(c) Sum of 90° and 90° = 90°+ 90° = 180°

$\therefore$ These are supplementary angles

(d) Sum of 45° and 45° = 45°+ 45° = 90°

$\therefore$ These are complementary angles

(e) Sum of 180° and 0° = 180°+ 0° = 180°

$\therefore$ These are supplementary angles

(f) Sum of 130° and 50° = 130°+ 50° = 180°

$\therefore$ These are supplementary angles

(g) Sum of 60° and 30° = 60°+ 30° = 90°

$\therefore$ These are complementary angles

(h) Sum of 0° and 90° = 0°+ 90° = 90°

$\therefore$ These are complementary angles

(i) Sum of 109° and 71° = 109°+ 71° = 180°

$\therefore$ These are supplementary angles

(j) Sum of 115° and 65° = 115°+ 65° = 180°

$\therefore$ These are supplementary angles

4. The angles are in the ratio 7:8

Let these be $7x$ and $8x$

$\because$ Angles are complementary

$\therefore$ $7x + 8x = 90° \Rightarrow 15x = 90°$

$$x = 90 \div 15$$

$$x = 6$$

Thus, the angles are $7 \times 6 = 42°$ and $8 \times 6 = 48°$

5. The angles are in the ratio 7:11

Let these be $7x$ and $8x$

$\because$ Angles are supplementary

$\therefore \quad 7x + 11x = 180°$

$18x = 180°$

$x = 180 \div 18$

$x = 10°$

Thus, the angles are $7 \times 10° = 70°$ and $11 \times 10° = 110°$

6. We know that, the sum of two supplementary angles are 180°

$\therefore \quad (3x + 15) + (2x + 5) = 180°$

$3x + 15 + 2x + 5 = 180°$

$5x + 20 = 180°$

$5x = 160°$

$x = 160° \div 5$

$x = 32°$

7. We know that, the sum of two complementary angles are 90°

$\therefore \quad (2x - 7) + (x + 4) = 90°$

$2x - 7 + x + 4 = 90°$

$3x - 3 = 90°$

$3x = 90° + 3$

$3x = 93°$

$x = 93° \div 3$

$x = 31°$

8. Since, *AOB* is a straight a line

$\therefore \quad \angle AOB = 180°$

$\Rightarrow \quad \angle AOP + \angle BOP = 180°$

$x + 10° + x - 10° = 180°$

$2x = 180°$

$x = 180° \div 2$

$x = 90°$

(a) $\angle AOP = x + 10°$
$= 90° + 10° = 100°$

(b) $\angle BOP = x - 10°$
$= 90° - 10° = 80°$

(c) $\angle BOP$ is acute angle

(d) $\angle AOP$ is obtuse angle

9. (a) $\because \quad \angle AOB = 180°$ (AB is a straight line)

$\therefore \quad \angle AOC + \angle BOC = 180°$

$72° + \angle BOC = 180°$

$\angle BOC = 180° - 72°$

$\angle BOC = 108°$

(b) $\angle AOD$ and $\angle DOB$; $\angle BOC$ and $\angle COA$; $\angle COA$ and $\angle AOD$; $\angle DOB$ and $\angle BOC$

(c) $\angle AOD$ and $\angle BOD$; $\angle AOC$ and $\angle BOD$

(d) Yes, if two lines intersect then vertically opposite angles are always equal.

10. $x = 45°,\ y = ?$

$\because \quad \angle ABD + \angle CBD = 180°$

$\therefore \quad x + y = 180°$

$45° + y = 180°$

$y = 180° - 45°$

$y = 135°$

11. $y = 2x$

$\because \quad \angle ABD + \angle CBD = 180°$

$\therefore \quad x + y = 180°$

$x + 2x = 180°$

$3x = 180°$

$x = 180° \div 3$

$x = 60°$

$\therefore \quad y = 2x = 2 \times 60°$

$y = 120°$

12. $x = 45°,\ y = ?$

$\because \quad \angle ABD + \angle CBD = 180°$

$\therefore \quad x + y = 180°$

$\frac{1}{2} y + y = 180°$

13. $y = 1\frac{1}{2}$ right angle

$\because \quad \angle ABD + \angle CBD = 180°$

$\therefore \quad x + y = 180°$

$x + 1\frac{1}{2} \times 90° = 180°$

$\frac{3}{2}y = 180°$ $\qquad$ $x + \frac{3}{2} \times 90° = 180°$

$y = \frac{180° \times 2}{3}$ $\qquad$ $x + 3 \times 45° = 180°$

$y = 60° \times 2$ $\qquad$ $x = 180° - 135°$

$y = 120°$ $\qquad$ $x = 45°$

14. (a) $x = y = 80°;\ z = 30°$

If $\quad x + y + z = 180°$

LHS $= 80° + 80° + 30° = 190°$

RHS $= 180°$, So LHS $\neq$ RHS

$\therefore$ *ABC* is not a straight line.

(b) $x = y = z = \frac{2}{3}$ right angle

If $\quad x + y + z = 180°$

$\frac{2}{3} \times 90° + \frac{2}{3} \times 90° + \frac{2}{3} \times 90° = 180°$

LHS $= \frac{6}{3} \times 90° = 2 \times 90° = 180° =$ RHS

$\therefore$ *ABC* is not a straight line.

(c) $x = \frac{2}{3}$ right angle, $y = 1$ right angle, $z = \frac{1}{2}$ right angle

If $\quad x + y + z = 180°$

LHS $= x + y + z$

$= \frac{2}{3}$ right angle + 1 right angle + $\frac{1}{2}$ right angle

$= \frac{2}{3} \times 90° + 90° + \frac{1}{2} \times 90°$

$= 2 \times 30° + 90° + 45° = 60° + 90° + 45° = 195°$

But RHS $= 180°$

So, LHS $\neq$ RHS

Thus, *ABC* is not a straight line.

(d) $z = 1\frac{1}{2}$ right angle, $x = y = 30°$

If $\quad x + y + z = 180°$

LHS $= x + y + z$

$= 30° + 30° + 1\frac{1}{2}$ right angle

$= 60° + \frac{3}{2} \times 90° = 60° + 3 \times 45°$

$= 60° + 135° = 195°$

But RHS $= 180°$

So, LHS $\neq$ RHS

Thus, *ABC* is not a straight line.

15. (a) Linear pair : $\angle 1, \angle 2; \angle 2, \angle 3; \angle 3, \angle 4; \angle 4, \angle 1; \angle 5, \angle 6; \angle 6, \angle 7;$
$\angle 7, \angle 8; \angle 8, \angle 5$

(b) Vertically opposite angle : $\angle 1, \angle 3; \angle 2, \angle 4; \angle 5, \angle 7; \angle 6, \angle 8$

16. Ray $\overrightarrow{AB}$ and Ray $\overrightarrow{AC}$ are opposite rays, so *CB* is a straight line

Therefore, $\angle CAD + \angle BAD = 180°$ (Linear pair)

$$2x° + 5x° - 30° = 180°$$

$$7x° - 30° = 180°$$

$$7x° = 180° + 30°$$

$$7x° = 210°$$

$$x° = 210° \div 7$$

$$x = 30°$$

Hence, the value of x is 30°.

17. (a) False (b) True (c) False (d) False

18. (a) If two angles are supplementary, then sum of their measures is **180**°.

(b) If sum of two angles is one right angle, they are **complementary**.

(c) Two angles forming a linear pair are **supplementary**.

(d) If two lines intersect, then vertically opposite angles are **equal**.

(e) If two adjacent angles are supplementary, then they form a **linear** pair.

(f) A line segment has **two** end points.

(g) A ray can be extended in **one** direction only.

(h) An **angle** is formed when two rays meet.

(i) An angle equal to its complement is 45°.

(j) An angle equal to its supplement is 90°.

Exercise 2.2

1. (a) A pair of vertically opposite angles is always **equal** in measure.

(b) If the sum of the measures of two angles is 180°, they are called **supplementary angles**.

(c) A pair of **adjacent** angles always have a common vertex.

(d) A line which intersects two or more lines at different points is called a **transversal**.

(e) The distance between two parallel lines is the **same** everywhere.

2. $\angle ABC = \angle BCD$ (Alternate angle)

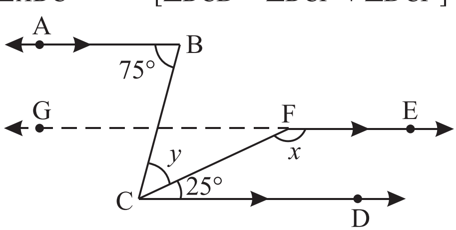
or $\angle BCD = \angle ABC$

$\angle BCF + \angle DCF = \angle ABC$ $[\angle BCD = \angle BCF + \angle DCF]$

$y + 25° = 75°$

$y = 75° - 25°$

$y = 50°$



Ray $\overrightarrow{FE}$ exceed in opposite direction to G.

So, $\angle GFC = \angle DCF$ ($FE || CD$, alternate angle)

$\angle GFC = 25°$

And $\angle GFC + \angle CFE = 180°$ (Linear pair)

$25° + \angle CFE = 180°$

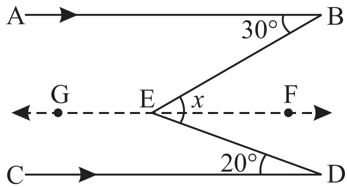
$\angle CFE = 180° - 25°$

$\angle CFE = 155°$

$x = 155°$

Hence, the value of x and y are 155° and 50° respectively.

3. To find the value of x, we draw a line m parallel to AB and CD.



$\angle ABE = \angle BEF$

(Alternate angle)

$\therefore \quad 30° = \angle BEF$

or $\angle BEF = 30°$ ...(i)

Similarly,

$\angle CDE = \angle DEF$ (Alternate angle)

$\therefore \quad 20° = \angle DEF$

or $\angle DEF = 20°$ ...(ii)

Adding equation (i) and (ii), we get

$\angle BEF + \angle DEF = 30° + 20°$ $(\because \angle BED = \angle BEF + \angle DEF)$

$\angle BED = \angle x = 50°$ and $\angle BED = x$

4. $\angle x = 115°$ (Vertically opposite angle)

$\angle x = \angle w = 115°$ (Corresponding angle)

$\angle y = 70°$ (Vertically opposite angle)

and $\angle y = \angle z = 70°$ (Corresponding angle)

5. $\angle a = 130°$ (Vertically opposite angle)

$\angle b = 150°$ (Vertically opposite angle)

$\angle d = \angle a = 130°$ (Corresponding angle)

and $\angle c = \angle b = 150°$ (Corresponding angle)

6. $\angle z = \angle A = 125°$ (Corresponding angle)

$\angle z + \angle x = 180°$ (Sum of opposite angle)

$125° + \angle x = 180°$

$\angle x = 180° - 125°$

$\angle x = 55°$

$\angle x + \angle y = 180°$ (Sum of Corresponding angle)

$55° + \angle y = 180°$

$\angle y = 180° - 55°$

$\angle y = 125°$

Hence, the values of x, y and z are $55°, 125°$ and $125°$ respectively.

7. $\angle BAC = \angle ACE$ (Alternate angle)

$\therefore$ $\angle ACE = 55°$ ($\angle BAC = 55°$)

$\therefore$ $\angle ECD = \angle ABC$ (Corresponding angle)

$\therefore$ $\angle ECD = 65°$

and $\angle ACD = \angle ACE + \angle ECD$

$= 65° + 55° = 120°$

8. $\because$ $\angle XAY$ is a straight line

$\therefore$ $\angle XAB + \angle BAC + \angle CAY = 180°$

$50° + 83° + \angle CAY = 180°$

$133° + \angle CAY = 180°$

$\angle CAY = 180° - 133°$

$\angle CAY = 47°$

$\angle ACB = \angle YAC$ (Alternate angle)

$\angle x = \angle CAY = \angle YAC$

$x = 47°$

9. (a) $\angle CDB = \angle CAB$ (Alternate angle)

$y = 65°$

$\angle CAB + \angle DBA = 180°$ (Sum of corresponding angle)

$65° + \angle DBA = 180°$

$\angle DBA = 180° - 65°$

$x = 115°$

$\angle z = \angle x$ (Opposite angles are equal)

$\angle z = 115°$

(b) $\angle CDA = \angle BAD$ (Alternate angle)

$x = 35°$

and $\angle BDA = \angle CAD$

$y = 40°$

10. $\angle y = 75°$ (Corresponding angles)

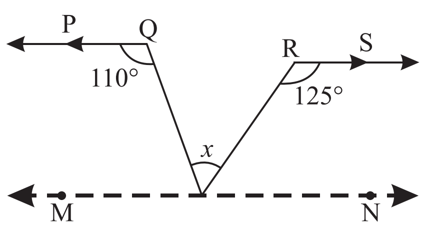
$\angle x + \angle y = 180°$ (Sum of corresponding angle)

$\angle x + 75° = 180°$

$\angle x = 180° - 75°$

$\angle x = 105°$

11. Draw a line *MN* passing through the point *O*, which is parallel to *PQ* and *RS*.



Now, $PQ || MN$ and QO is the transversal.

$\therefore \angle PQO + \angle MNQ = 180°$ (Co-interior angles)

$110° + \angle MNQ = 180°$

$$\angle MNQ = 180° - 110°$$

$$\angle NOR = 55°$$

Now, MON is a straight line

$\therefore \quad \angle POQ + \angle QOR + \angle NOR = 180°$ (Co-interior angles)

$$70° + x + 55° = 180°$$

$$x + 125° = 180°$$

$$x = 180° - 125°$$

$$x = 55°$$

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

HOTS

We know that vertically opposite angles are equal to each other, and two angles whose sum is 180° are called supplementary angles.

So, $x + 25 = y + 15$

And $x - y = 15 - 25$

$x - y = -10$ ...(i)

And $x + y = 180$ ...(i)

Adding the equation (i) and (ii), we get

$$2x = 170$$

$$x = 85$$

Putting the values of x in equation (ii), we get

$$85 + y = 180°$$

$$y = 180° - 85$$

$$y = 95°$$

So, vertically opposite angle : $x + 25; \quad y + 15$

$85 + 25 \; ; \; 95 + 15$

$110 \quad ; \quad 110$

Chapter

3 Number Play

Exercise 3.1

1. (a) 2,502,632 (b) 37,48,763

(c) 32,660,505 (d) 20,04,004

2. (a) 286452

Indian system : Two lakh eighty-six thousand four hundred fifty-two.

International system : Two hundred eighty-six thousand four hundred fifty-two.

(b) 7085006

Indian system : Seventy lakh eighty-five thousand six.

International system : Seven million eighty-five thousand six.

(c) 1408090

Indian system : Fourteen lakh eight thousand ninety.

International system : One million four hundred eight thousand ninety.

(d) 1000892

Indian system : Ten lakh eight hundred ninety-two.

International system : One million eight hundred ninety-two.

3. (a) 567624

Indian System = 5,67,624

International System = 567,624

(b) 8095262

Indian System = 80,95,262

International System = 8,095,262

(c) 900567

Indian System = 9,00,567

International System = 900,567

(d) 10005672;

Indian System = 1,00,05,672

International System = 10,005,672

4. (a) 245789

$= 200000 + 40000 + 5000 + 700 + 80 + 9$

(b) $200562 = 200000 + 500 + 60 + 2$

(c) $408090 = 400000 + 8000 + 90$

(d) $756200 = 700000 + 50000 + 6000 + 200$

5. The place value of 5 in $235678 = 5000$

The face value of 5 in 235678 = 5

So, the difference between place value and face value of 5 in $235678 = 5000 - 5 = 4995$

6. The place value of second 6 in 6523689 from left = 6000000

The place value of first 6 in 6523689 from left = 600

So, the difference between place value of two 6's in 6523689

$= 6000000 - 600 = 5999400$

7. (a) 1 thousand = **10** hundred. (b) 10 crore = **100000** thousands

(c) 1 million = **10** lakhs (d) 10 million = **1** crore

(e) 1 million = **1000** thousands.

Exercise 3.2

1. (a) 799812, 979812, 997812, 989712

All numbers have equal number of digits.

Thus, on comparing the extreme left digits,

$799812 < 979812 < 989712 < 997812$

Ascending order : 799812, 979812, 989712, 997812

(b) 560853, 586035, 568053, 556083

All numbers have equal number of digits.

Thus, on comparing the extreme left digits.

$556083 < 560853 < 568053 < 586035$

Ascending order : 556083, 560853, 568053, 586035

(c) 864391, 896413, 986134, 968341

All numbers have equal number of digits.

Thus, on comparing the extreme left digits,

$864391 < 896413 < 968341 < 986134$

Ascending order : 864391, 896413, 968341, 986134

2. (a) 725962, 796522, 976252, 967522, 956722

All numbers have equal number of digits.

Thus, on comparing the extreme left digits,

976252< 967522< 956722< 796522< 725962

Descending order : 976252, 967522, 956722, 796522, 725962

(b) 813265, 816523, 865231, 685312, 651283

All numbers have equal number of digits.

Thus, on comparing the extreme left digits,

865231< 816523< 813265< 685312< 651283

Descending order : 865231, 816523, 813265, 685312, 651283

(c) 369742, 397642, 372469, 324679 and 324697

All numbers have equal number of digits.

Thus, on comparing the extreme left digits,

397642< 372469< 369742< 324697< 324679

Descending order : 397642, 372469, 369742, 324697, 324679

3. (a) 7, 4, 6, 8 and 2

The greatest number using the digits 4, 7, 6, 8, 2 only once is 87642.

The smallest number using the digits 7, 4, 6, 8, 2 only once is 24678.

(b) 6, 9, 0, 4 and 5

The greatest number using the digits 6, 9, 0, 4, 5 only once is 96540.

The smallest number using the digits 6, 9, 0, 4, 5 only once is 40569.

(c) 2, 5, 8, 0 and 7

The greatest number using the digits 2, 5, 8, 0, 7 only once is 87520.

The smallest number using the digits 2, 5, 8, 0, 7 only once is 20578.

4. (a) 7, 4, 5, and 8

The greatest 5-digit number using the digits 7, 4, 5, 8 with repeating one digit is 88754.

(b) 2, 3, 0 and 9

The greatest 5-digit number using the digits 2, 3, 0, 9 with repeating one digit is 99320.

(c) 6, 7, 3 and 1

The greatest 5-digit number using the digits 6, 7, 3, 1 with repeating one digit is 77631.

5. (a) 6, 2 1 and 7

The smallest 5-digit number using the digits 6, 2, 1, 7 with repeating one digit is 11267.

(b) 5, 8, 0 and 3

The smallest 5-digit number using the digits 5, 8, 0, 3 with repeating one digit is 30058.

(c) 9, 4, 2 and 7

The smallest 5-digit number using the digits 9, 4, 2, 7 with repeating one digit is 22479.

6. (a) Two different digits.

The largest 4-digit number using two different digits is 9998.

(b) Only one digit.

The largest 4-digit number using only one digit is 9999.

7. The largest 6-digit number is 999999.

The largest 5-digit number is 99999.

Their difference $= 999999 - 99999 = 900000$

8. The smallest 6-digit number is 100000.

The smallest 5-digit number is 10000.

Their sum $= 100000 + 10000 = 110000.$

Exercise 3.3

1. (a) $50000 + 45321 = 95321$ (b) $186 \times 535 = 99510$

(c) $2061 \div 9 = 229$ (d) $1331 \div 11 = 121$

(e) $3867500 - 3865347 = 2153$ (f) $180 \times 345 = 62100$

(g) $319 \times 706 = 225214$ (h) $24080 \div 43 = 560$

2. A milk dairy produced milk in a day = 75,678 L

Milk supplied to milk depot = 67689 L

So, the milk left in the dairy = $(75678 - 67689)\, L = 79.89\, L$

3. A factory produced pens in the month of January = 36420

The factory produced pens in the month of February = 48576

The factory produced pens in the month of March = 53675

So, total number of pens produced by factory

$= 86420 + 48576 + 53675 = 138671$

4. Total population of a city = 2873468

Number of males = 1643728

Number of females = 1043726

So, number of children $= 2873468 - (1643728 + 1043726)$

$= 2873468 - 2687454 = 186014$

5. The required number $= 10000000 - 6872526 = 3127474$

6. To make a shirt, the length of the cloth = 2.20 m

So, to make 21 shirts, the length of cloth $= 21 \times 2.20$ m

$= 46.20$ m

Hence, 46 m 20 cm length of the cloth will be required for 21 such shirts.

7. Weight of a medicine = 25 mg

So, the weight of a box containing 20000 such medicine

$= 25 \times 20000$ mg

$= 500000$ mg $= 500$ g

So, the weight of box in kg $= (500 \div 1000)$ kg $= \frac{1}{2}$ kg.

8. Sheela had $= ₹\ 50000$

The cost of one radio set $= ₹\ 1300$

So, the cost of 35 radio sets $= ₹\ 35 \times 1300$

$= ₹\ 45{,}500$

So, the amount left with her $= ₹\ (50000 - 45500) = ₹\ 4500$

9. Mr. Shekhar save per month $= ₹\ 250$

Mr. Shekhar will save money in 3 year $= ₹\ 250 \times 36 = ₹\ 9000$

Hence, he will save ₹ 9000 in 3 years.

10. The mass of a gas cylinder $= 14.250$ kg

So, the mass of 22 such cylinder $= 22 \times 14.250$ kg $= 313.500$ kg

Hence, 313 kg 500 g is the total mass of 22 such cylinders.

11. Total number of trees $= 357$

Number of rows $= 17$

So, the number of trees in each row $= 357 \div 17 = 21$ trees

12. The total salary of 93 workers of a company $= ₹\ 187395$

So, the salary of 93 worker of a company $= ₹\ (187395 \div 93)$

$= ₹\ 2015$

Hence, the salary of each worker is ₹ 2015.

Exercise 3.4

1. (a) 3425

Given number is 3425

342⑤, 5 is equal to 5.

So, 3425 rounded to nearest ten is 3430

(b) 353

Given number is 353.

35③, 3 is less than 5.

So, 353 rounded to nearest ten is 350.

(c) 157

Given number is 157.

15⑦, 7 is greater than 5.

So, 157 rounded to nearest ten is 160.

(d) 6428

Given number is 6428.

642⑧, 8 is greater than 5.

So, 6428 rounded to nearest ten is 6430.

(e) 7439

Given number is 7439.

743(9), 9 is greater than 5.

So, 7439 roundd to nearest ten is 7440.

2. (a) 24693

Given number is 24693.

24(6)9 3, 9 is greater than 5.

So, 24693 rounded to nearest hundred is 24700.

(b) 30925

Given number is 30925.

309(2)5, 2 is less than 5.

So, 30925 rounded to nearest hundred is 30900

(c) 27563

Given number is 27563.

275(6)3, 6 is greater than 5.

So, 27563 rounded to nearest hundred is 27600.

(d) 14675

Given number is 14675.

146 7(5), 7 is greater than 5.

So, 14675 rounded to nearest hundred is 14700.

(e) 10392

Given number is 10392.

103(9)2, 9 is greater than 5.

So, 10392 rounded to nearest hundred is 10400.

3. (a) 4452

Given number is 4452.

4(4) 52, 4 is less than 5.

So, 4452 rounded to nearest thousand is 4000.

(b) 2656

Given number is 2656.

2(6)56, 6 is greater than 5.

So, 2656 rounded to nearest thousand is 3000.

(c) 26575

Given number is 26575.

26(5)75, 5 is equal to 5.

So, 26575 rounded to nearest thousand is 27000.

(d) 14567

Given number is 14567.

14(5)6 7 5 is equal to 5.

So, 14567 rounded to nearest thousand is 15000.

(e) 32222

Given number is 32222.

32(2)22, 2 is less than 5.

So, 32222 rounded to nearest thousand is 32000.

4. (a) 845625

Given number is 845625.

84(5)625, 5 is equal to 5.

So, 845625 rounded to nearest ten thousand is 850000.

(b) 243925

Given number is 243925.

24(3)925, 3 is less than 5.

So, 243925 rounded to nearest ten thousand is 240000.

(c) 129875

Given number is 129875

12(9)875, 9 is greater than 5.

So, 129875 rounded to nearest ten thousand is 130000.

(d) 124356

Given number is 124356.

12(4)356, 4 is less than 5.

So, 124356 rounded to nearest ten thousand is 120000.

(e) 10952

Given number is 10952.

1(0)952, 0 is less than 5.

So, 10952 rounded to nearest ten thousand is 10000.

5. (a) $16472 + 21434 + 65556$

16472 is approximated to 16470 [$\because$ ones digit i.e, $2 < 5$]

12434 is approximated to 21430 [$\because$ ones digit i.e., $4 < 5$]

65556 is approximated to 65560 [$\because$ ones digit i.e., $6 > 5$]

Therefore, $16470 + 21430 + 65560 = 103460$

(b) $21470 + 12437 + 230$

21470 is approximated to 21470 [$\because$ ones digit i.e., $0 < 5$]

12437 is approximated to 12440 [$\because$ ones digit i.e., $7 > 5$]

230 is approximated to 230 [$\because$ ones digit i.e., $0 < 5$]

Therfore, $21470 + 12430 + 230 = 34130$

(c) $74635 + 82960 + 1245$

74635 is approximated to 74640 [$\because$ ones digit i.e., $5 = 5$]

82960 is approximated to 82960 [$\because$ ones digit i.e., $0 < 5$]

1245 is approximated to 1250 [$\therefore$ ones digit i.e., $5 = 5$]

Therefore, $74640 + 82960 + 1250 = 158850$.

6. (a) $7531 - 1916$

Here, 7581 rounded to nearest hundred is 7500 and 1916 rounded to nearest hundred is 1900.

So, their difference $= 7500 - 1900 = 5600$.

(b) $53045 - 1456$

Here, 53045 rounded to nearest hundred is 53000 and 1456 rounded to nearest hundred is 1500.

So, their difference $= 53000 - 1500 = 51500$.

(c) $9525 - 3542$

Here, 9525 rounded to nearest hundred is 9500, and 3542 rounded to nearest hundred is 3500.

So, their difference $= 9500 - 3500 = 6000$

(d) $8260 - 4919$

Here, 8260 rounded to nearest hundred is 8300 and 4919 rounded to nearest hundred is 4900.

So, their difference $= 8300 - 4900 = 3400$.

7. The mathematics book of class VI contains pages = 492

By estimating 492 to the nearest tens, we get 490.

And the science book of class VI contains pages = 368

By estimating 368 to the nearest tens, we get 370.

Therefore, estimate the difference in the number of pages of two books to the nearest ten $= 490 - 370$

$= 120$.

8. (a) 39×42

39 and 42 rounded to nearest tens are 40 and 40.

So, $40 \times 40 = 1600$

(b) 86×21

86 and 21 rounded to nearest tens are 90 and 20

So, the product to nearest tens = $90 \times 20 = 1800$

(c) 115×232

115 and 232 round to nearest tens are 120 and 230.

So, the product to nearest tens = $120 \times 230 = 27600$

(d) 1456×230

1456 and 230 round to nearest tens are 1460 and 230.

So, the product to nearest tens = $1460 \times 230 = 335800$

9. Tony covered the distance everyday = 365 m

So, the distance covered by him in 130 days = 365×130 m

= 47450 m

Estimate the product to the nearest thousands = 47000 m.

10. (a) $638 \div 23$

638 rounded to nearest ten is 640.

23 rounded to nearest ten is 20

So, $640 \div 20 = 32$

(b) $751 \div 32$

751 rounded to nearest ten is 750.

32 rounded to nearest ten is 30

So, $750 \div 30 = 25$

(c) $7098 \div 52$

7098 rounded to nearest ten is 7100.

52 rounded to nearest ten is 50

So, $7100 \div 50 = 142$

(d) $2432 \div 55$

2432 rounded to nearest ten is 2430.

55 rounded to nearest ten is 60.

So, $2430 \div 60 = 40.5$

(e) $2660 \div 19$

2660 rounded to nearest ten is 2660.

19 rounded to nearest ten is 20.

So, $2660 \div 20 = 133$

Exercise 3.5

1. $9 \div 3 + 2 \times 7 - 16$

$= 3 + 2 \times 7 - 16$

$= 3 + 14 - 16$

$= 17 - 16 = 1$

2. $(3 \times 4 - 8) + (44 \div 11 + 6)$

$= (12 - 8) + (4 + 6)$

$= 4 + 10$

$= 14$

3. $3 \times (2 \times 5 - 6) + 8 - 15 \div 5$

$= 3 \times (10 - 6) + 8 - 3$

$= 3 \times 4 + 8 - 3$

$= 12 + 8 - 3$

$= 20 - 3 = 17$

4. $(9 + 12) \div 7 + 36 \div 2$ of 3

$= 21 \div 7 + 36 \div 6$

$= 3 + 6$

$= 9$

5. $(2$ of $4 + 6) \div 2 - 35 \div 7$

$= (8 + 6) \div 2 - 5$

$= 14 \div 2 - 5$

$= 7 - 5 = 2$

6. $33 - [22 - \{(10 - 5 \text{ of } 2\}]$

$= 33 - [22 - \{10 - 10\}]$

$= 33 - [22 - 0]$

$= 33 - 22 = 11$

7. $18 + [46 - \{12 + 12 \div 3\}]$

$= 18 + [46 - \{12 + 4]$

$= 18 + [46 - 16]$

$= 18 + 30 = 48$

8. $12 + [7 - (4 + 2) - \overline{5 - 4}]$

$= 12 + [7 - 6 - 1]$

$= 12 + [7 - 7]$

$= 12 + 0 = 12$

9. $16+[7+\{3+7)-\overline{5-3}\}]$

$=16+[7+\{10-2\}]$

$=16+[7+8]$

$=16+15$

$=31$

10. $13+6[10-6\div 3]$

$=13+6[10-2]$

$=13+6\times 8$

$=13+48$

$=61$

Exercise 3.6

1. (a) 4 = IV

(b) 8 = VIII

(c) 15 = 10 + 5 = X + V = XV

(d) 34 = 10 + 10 + 10 + 4

= X + X + X + IV

= XXXIV

(e) 46 = (50 – 10) + 6

= XL + VI = XLVI

(f) 54 = 50 + 4

= L + IV

= LIV

(g) 61 = 50 + 10 + 1

= LX + I = LXI

(h) = 75 = 50 + 10 + 10 + 5

= L + X + X + V

= LXXV

(i) 83 = 50 + 10 + 10 + 10 + 3

= L + X + X + X + III

= LXXXIII

(j) 91 = (100 – 10) + 1

= XC + I = XCI

(k) 95

= (100 – 10) + 5

= XC + V = XCV

(l) 88 = 50 + 10 + 10 + 10 + 5 + 3

= L + X + X + V + III

= LXXXVIII

(m) 99 = (100 – 10) + 9

= XC + IX

= XCIX

(n) 96 = (100 – 10) + 6

= XC + VI

= XCVI

(o) 79

= 50 + 10 + 10 + 9

= L + X + X + IX

= LXXIX

2. (a) $\text{XXVI} = 10 + 10 + 6 = 26$

(b) $\text{XXXIV} = 10 + 10 + 10 + 4 = 34$

(c) $\text{XLV} = (50 - 10) + 5 = 40 + 5 = 45$

(d) $\text{LIV} = 50 + 4 = 54$

(e) $\text{LXXV} = 50 + 10 + 10 + 5 = 75$

(f) $\text{XCI} = (100 - 10) + 1 = 91$

(g) $\text{XCVI} = (100 - 10) + 6 = 96$

(h) $\text{XCIV} = (100 - 10) + 4 = 94$

(i) $\text{XLIX} = (50 - 10) + 9 = 49$

(j) $\text{XXVIII} = 10 + 10 + 8 = 28$

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

Chapter 4

Data Handling and Presentation

Exercise 4.1

1. Arranging the data in increasing order : 37, 39, 44, 48, 48, 50, 52, 53, 55, 56, 58, 58, 59, 60, 60, 60, 61, 62, 64, 67, 68, 70, 75, 77, 78, 84, 88, 90, 98, 100

(a) In $30 - 39 = 37, 39$; In $40 - 49 = 44, 48, 48$;

In $50 - 59 = 50, 52, 53, 55, 56, 58, 58\ 59$;

In $60 - 69 = 60, 60, 60, 61, 62, 64, 67, 68$;

In $70 - 79 = 70, 75, 77, 78$; In $80 - 89 = 84, 88$;

In $90 - 91 = 90, 98$; In $100 - 109 = 100$

(b) The hightest scored is 100.

(c) The lowest scored is 37.

(d) 2 students

(e) 5 students

2.

Grades obtained by Students	Tally marks	Frequency
A	~~||||~~ ~~||||~~	10
B	~~||||~~ ||||	9
C	~~||||~~ ||||	9
D	~~||||~~ |||	8
E	||||	4
	Total	40

(a) 10 students got *A* grade. (b) There are 4 students failed.

(c) There are 40 students appeared for the music test.

3.

No. of children in each family	Tally marks	Frequency
0	~~||||~~	5
1	~~||||~~ ||	7
2	~~||||~~ ~~||||~~ ||	12
3	~~||||~~	5
4	~~||||~~ |	6
5	|||	3
6	|||	3
	Total	41

4.

Number of die	Tally marks	Frequency
1	~~||||~~	5
2	~~||||~~ ~~||||~~	10
3	~~||||~~ ||||	9
4	~~||||~~ ||||	9
5	~~||||~~ ||||	9
6	~~||||~~ ||||	9
	Total	51

5.

Weather	Tally marks	Frequency
Sunny	卌 ||	7
Cloudy	卌 卌	10
Rainy	卌 卌 卌 |||	13

(a) There were 7 sunny days. (b) There were 13 rainy days.

Exercise 4.2

1. (a) The sale was minimum in fourth week.
(b) The sale was minimum in second week.
(c) 200 baskets were sold in the first week.
(d) 250 baskets were sold in the third week.
(e) 850 baskets were sold in the month.

2. (a) Chowmein is liked by maximum number of students.
(b) Pav-Bhaji is liked by the minimum number of students.
(c) Burger and Pizza are equally liked by the students.
(d) 13 students liked Dosa.

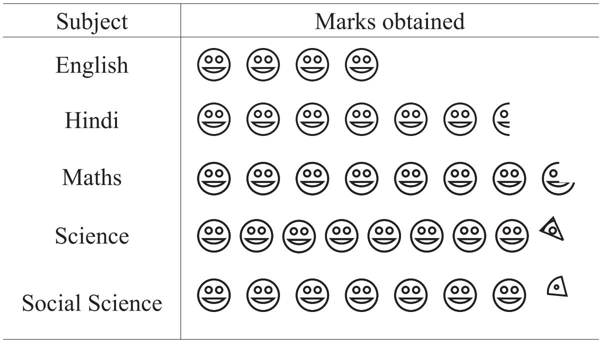
3. Before we start drawing the pictograph, we need to decide the symbol and the scale. Let us choose ☺ as the symbol as it represents woman and is easy to draw.

Choosing a scale of 100, 500 or 1000 for one ☺ is not feasible. We can see that the given number are all multiples of 1000, so we can choose the scale one ☺ = 1000 women. Thus, 1000 students is $\frac{5000}{1000}$ = 5 symbols. Now, we can draw the pictograph easily.

Year	Number of women
2006	☺ ☺ ☺ ☺ ☺
2007	☺ ☺ ☺ ☺ ☺ ☺ ☺
2008	☺ ☺ ☺ ☺ ☺ ☺ ☺ ☺
2009	☺ ☺ ☺ ☺ ☺ ☺ ☺ ☺ ☺ ☺

4. Before we start drawing the pictograph, we need to decide the symbol and the scale. Let us choose ☺ as the symbol as it represents man and is easy to draw. Choosing a scale of 1, 10, or 20 for one number are all multiples of 10.

So, scale ☺ $= 10$ student

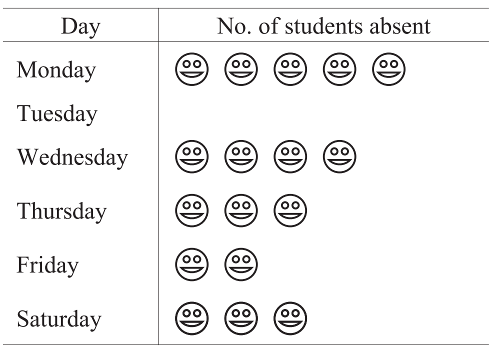


(a) In Math's (b) In Hindi

(c) The difference between the maximum and minimum marks

$$= 88 - 65 = 23$$

5. Represent the above data by a pictograph as given below :
Scale : ☺ = 5 students



Exercise 4.3

1. (a) Number of bikes manufactured in 7 sucessive year.

(b) 1 cm = 200 bikes

(c) In 2018, the production of bikes was minimum.

(d) In 2020 and 2022, the production of bikes was same.

(f) (i) In 800 bikes were manufactured in 2018.

(ii) 900 bikes were manufactured in 2019.

(iii) 1100 bikes were manufactured in 2020.

2. (a) Number of books sold on 6 sccessive days.

(b) 1 cm = 50 books.

(c) In Saturday, the sale of books was maximum.

(d) In Wednesday, the sale of books was minimum.

(e) In Monday and Thursday, the sale was equal.

(f) 350 books were sold on Tuesday.

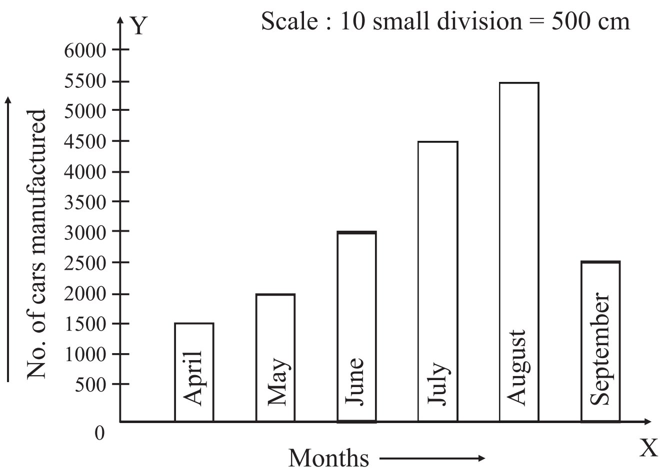
(g) 400 books were sold on Friday.

(h) On Sunday.

3. (a) Bar graph shows the rainfall (in cm) in a particular city in the later halve of year 2006.

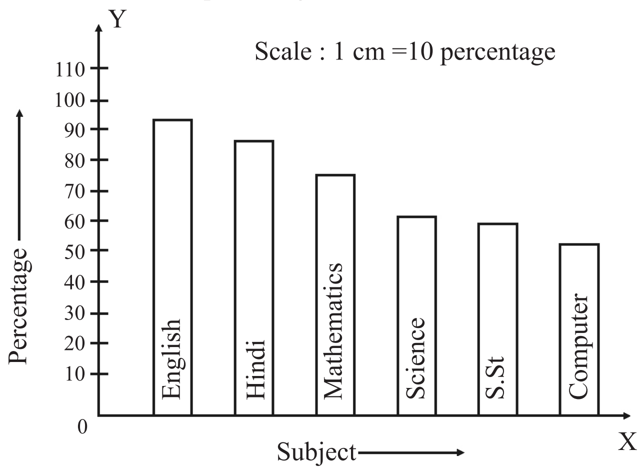
(b) In October (c) In August (d) 12.5 cm (e) In November.

4. Scale : 10 small division = 500 cm



1. Draw the two axes OX and OY.
2. On the X-axis mark the places for 6 bars equal in width and equal distance apart. (6 bars as we have to show the strength for 6 months.)
3. Write the various months below the marked space.
4. Choose an appropriate scale. As maximum strength is 5500 we can take the sacle 1 unit length (1 cm) for 500 cars.
5. Mark the numbers 500, 1000, 1500, 2000 ..... up to 6000 on the Y-axis at unit length intervals.
6. Above April, construct a bar up to the 1500 cars.
7. Construct the other bars neatly.
8. Similarly for bars above may, June, July, August, September, we have to count the appropriate number of small lines.
9. Shade the bars (or pattern them).

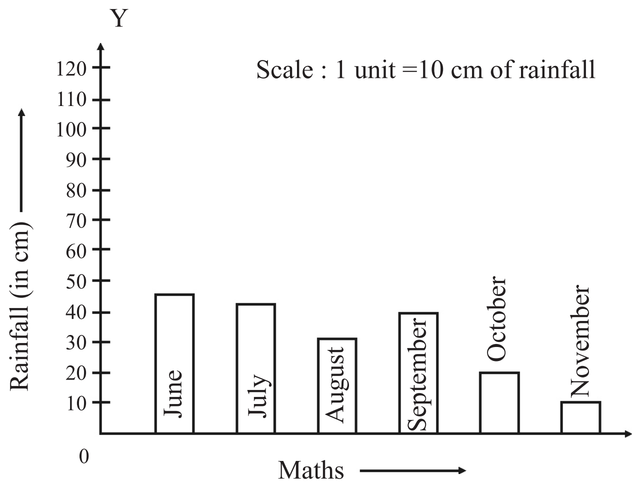
5. Scale : 1 cm =10 percentage



1. First draw two perpendicular lines-one horizontal and one vertical on a graph paper. Name the horizontal axis as x-axis and vertical axis as y-axis.
2. Take subject along x-axis and percentage along y-axis.
3. Along the x-axis choose convenient uniform width of bars. The graph should be uniform between two bars (rectangles).
4. Choose a suitable scale to determine the height of the bar. Take 1 cm as 10 percentages.
5. The bar graph showing the percentage in different subject is as follows :

6. Scale :

1. First draw two perpendicular lines-one horizontal and one vertical on a graph paper. Name the horizontal axis as x-axis and vertical axis as y-axis.



2. Take months along x-axis and rainfall (in cm) along y-axis.
3. Along the x-axis choose convenient uniform width of bars. The graph should be uniform between two bars (rectangles).

4. Choose a suitable scale to determine the height of the bar. Take 1 unit as 10 cm of rainfall.

5. The bar graph showing the rainfall (in cm) in different months is as follows.

MCQs 1. (b) 2. (c) 3. (d) 4. (d)

Mental Maths :

Fill in the blanks :

1. The numerical facts collected from an observation is called **data.**
2. In the bar graphs, the **width** of the bars is uniform throughout.
3. Data can be arranged in a tabular form using **pictures.**
4. In a bar graph, the space between the two bars is kept **same distance.**
5. The data collected directly from the source is called the **primary data.**

Chapter 5

Prime Time

Exercise 5.1

1. We know that a factor of a number is an exact divisor of that number, i.e., when it divides a number the remainder is equal to zero (0).

(a) We know that, $15 = 1 \times 15 = 5 \times 3$

Hence, all the possible numbers which can divide 15 are 1, 3, 5 and 15.

So, the factors of 15 are 1, 3, 5 and 15.

(b) We know that, $60 = 1 \times 60 = 2 \times 30 = 3 \times 20 = 4 \times 15 = 5 \times 12 = 6 \times 10$

Hence, all the possible numbers which can divide 60 are 1, 2, 3, 4, 5, 6, 10, 12, 15, 20, 30 and 60.

So, the factors of 60 are 1, 2, 3, 4, 5, 6, 10, 12, 15, 20, 30 and 60.

(c) We know that, $16 = 1 \times 16 = 2 \times 8 = 4 \times 4$

Hence, all the possible numbers which can divide 16 are 1, 2, 4, 8 and 16.

So, the factors of 16 are 1, 2, 4, 8 and 16.

(d) We know that, $56 = 1 \times 56 = 2 \times 28 = 4 \times 14 = 7 \times 8$

Hence, all the possible numbers which can divide 56 are 1, 2, 4, 7, 8, 14, 28 and 56.

So, the factors of 56 are 1, 2, 4, 7, 8, 14, 28 and 56.

(e) We know that, $36 = 1 \times 36 = 2 \times 18 = 3 \times 12 = 4 \times 9 = 6 \times 6$

Hence, all the possible numbers which can divide 36 are 1, 2, 3, 4, 6, 9, 12, 18 and 36.

So, the factors of 36 are 1, 2, 3, 4, 6, 9, 12, 18 and 36.

(f) We know that, $144 = 1 \times 144 = 2 \times 72 = 3 \times 48 = 4 \times 36$
$= 6 \times 24 = 8 \times 18 = 9 \times 16 = 12 \times 12$

Hence, all the possible numbers which can divide 144 are 1, 2, 3, 4, 6, 8, 9, 12, 16, 18, 24, 36, 48, 72, and 144.

So, the factors of 144 are 1, 2, 3, 4, 6, 8, 9, 12, 16, 18, 24, 36, 48, 72 and 144.

2. (a) odd (b) odd (c) even (d) even (e) odd (f) odd

3. (a) The first five multiples of 9 are :

$9 \times 1 = 9$

$9 \times 2 = 18$

$9 \times 3 = 27$

$9 \times 4 = 36$

$9 \times 5 = 45$

(b) The first five multiples of 19 are :

$19 \times 1 = 19$

$19 \times 2 = 38$

$19 \times 3 = 57$

$19 \times 4 = 76$

$19 \times 5 = 95$

(c) The first multiples of 25 are :

$25 \times 1 = 25$

$25 \times 2 = 50$

$25 \times 3 = 75$

$25 \times 4 = 100$

$25 \times 5 = 125$

(d) The first five multiples of 11 are :

$11 \times 1 = 11$

$11 \times 2 = 22$

$11 \times 3 = 33$

$11 \times 4 = 44$

$11 \times 5 = 55$

(e) The first five multiples of 20 are :

$20 \times 1 = 20$
$20 \times 2 = 40$
$20 \times 3 = 60$
$20 \times 4 = 80$
$20 \times 5 = 100$

(f) The first five multiples of 12 are :

$12 \times 1 = 12$
$12 \times 2 = 24$
$12 \times 3 = 36$
$12 \times 4 = 48$
$12 \times 5 = 60$

4. All prime numbers between 10 and 50 are 11, 13, 17, 19, 23, 29, 31, 37, 41, 43 and 47.

5. Yes, the smallest odd composite number is 9.

6. All pairs of twin prime numbers between 40 and 80 are (41, 43); (59, 61) and (71, 73).

7. All odd composite numbers which are less than 30 = 9, 15, 21, 25, and 27.

8. (a) $24 = 5 + 19 = 11 + 13 = 7 + 17$

(b) $44 = 3 + 41 = 13 + 31 = 7 + 37$

(c) $76 = 3 + 73 = 5 + 71 = 17 + 59 = 53 + 23 = 47 + 29$

(d) $80 = 7 + 73 = 13 + 67 = 19 + 61 = 37 + 43$

9. (a) $31 = 3 + 5 + 23 = 5 + 7 + 19 = 3 + 11 + 17 = 7 + 13 + 11$

(b) $61 = 3 + 5 + 53 = 5 + 13 + 43 = 7 + 11 + 43 = 3 + 17 + 41$
$= 5 + 19 + 37 = 13 + 17 + 31 = 13 + 19 + 29$

(c) $71 = 7 + 23 + 41 = 3 + 31 + 37 = 19 + 23 + 29 = 7 + 17 + 47$
$= 5 + 23 + 43 = 13 + 17 + 41 = 11 + 29 + 31$

(d) $35 = 5 + 7 + 23 = 7 + 11 + 17 = 3 + 13 + 19 = 5 + 13 + 17$

10. (a) F (b) T (c) T (d) F (e) F (f) F (g) F (h) F (i) T

11. The factor of 24 are 1, 2, 3, 4, 6, 8, 12 and 24.

The sum of 1, 2, 3, 4, 6, 8 and 12 $= 1 + 2 + 3 + 4 + 6 + 8 + 12$
$= 36$

Since, 36 is less than twice of 24.

So, 24 is not a perfect number.

12. The required prime number are 3, 13, 23, 43, 53, 73 and 83.

Exercise 5.2

1. **Divisibility test for 3:**

(a) We have, 3522

The sum of digits $= 3 + 5 + 2 + 2 = 12$, which is divisible by 3. So, 3522 is divisible by 3.

(b) We have, 756

The sum of digits $= 7 + 5 + 6 = 18$, which is divisible by 3. So, 756 is divisible by 3.

(c) We have 21335

The sum of digits $= 2 + 1 + 3 + 3 + 5 = 14$, which is not divisible by 3. So, 21335 is not divisible by 3.

(d) We have 50391

The sum of digits $= 5 + 0 + 3 + 9 + 1 = 18$, which is divisible by 3. So, 50391 is divisible by 3.

(e) We have, 8964

The sum of digits $= 8 + 9 + 6 + 4 = 27$, which is divisible by 3. So, 8964 is divisible by 3.

(f) We have, 100090

The sum of digits $= 1 + 0 + 0 + 0 + 9 + 0 = 10$, which is not divisible by 3. So, 100090 is not divisible by 3.

(g) We have, 103081

The sum of digits $= 1 + 0 + 3 + 0 + 8 + 1 = 13$, which is not divisible by 3. So, 103081 is not divisible by 3.

(h) We have, 50391

The sum of digits $= 5 + 0 + 3 + 9 + 1 = 18$, which is divisible by 3. So, 50391 is divisible by 3.

(i) We have 20834

The sum of digits = 2 + 0 + 8 + 3 + 4 = 17, which is not divisible by 3. So, 20834 is not divisible by 3.

Divisibility test for 5 :

(a) 3522 is not divisible by 5 because its ones digit is not 5 or 0.

(b) 756 is not divisible by 5 because its ones digit is not 5 or 0.

(c) 21335 is divisible by 5 because its ones digit is 5 or 0.

(d) 50391 is not divisible by 5 because its ones digit is not 5 or 0.

(e) 8964 is not divisible by 5 because its ones digit is not 5 or 0.

(f) 100090 is divisible by 5 because its ones digit is 5 or 0.

(g) 103081 is not divisible by 5 because its ones digit is not 5 or 0.

(h) 50391 is not divisible by 5 because its ones digit is 5 or 0.

(i) 20834 is not divisible by 5 because its ones digit is not 5 or 0.

Divisibility test for 6 :

(a) In 3522, the ones digit is 2, so it is divisible by 2.

The sum of digits in 3522 is 3 + 5 + 2 + 2 = 12, which is divisible by 3. So, 3522 is divisible by 6.

(b) In 756, the ones digit is 6, so it is divisible by 2.

The sum of digits in 756 is 7 + 5 + 6 = 18, which is divisible by 3. So, 756 is divisible by 6.

(c) In 21335, the ones digit is 5, so it is not divisible by 2. So, 21335 is not divisible by 6.

(d) In 50391, the ones digit is 1, so it is not divisible by 2.

So, 50391 is not divisible by 6.

(e) In 8964, the ones digit is 4 so it is divisible by 2. The sum of digits in 8964 is 8 + 9 + 6 + 4 = 27, which is divisible by 3. So, 8964 is divisible by 6.

(f) In 100090, the ones digit is 0, so it is divisible by 2. The sum of digits in 100090 is $1 + 0 + 0 + 0 + 9 + 0 = 10$, which is not divisible by 3. So, 100090 is not divisible by 6.

(g) In 103081, the ones digit is 1, so it is not divisible by 2. So, 103081 is not divisible by 6.

(h) In 50391, the ones digit is 1, so it is not divisible by 2. So, 50391 is not divisible by 6.

(i) In 20834, the ones digit is 4, so it is divisible by 2. The sum of digits in 20834 is $2 + 0 + 8 + 3 + 4 = 17$, which is not divisible by 3. So, 20834 is not divisible by 6.

Divisibility test for 9 :

(a) In 3522, the sum of the digits is $3 + 5 + 2 + 2 = 12$, which is not divisible by 9. So, 3522 is not divisible by 9.

(b) In 756, the sum of the digits is $7 + 5 + 6 = 18$, which is divisible by 9. So, 756 is divisible by 9.

(c) In 21335, the sum of the digits is $2 + 1 + 3 + 3 + 5 = 14$, which is not divisible by 9. So, 21335 is not divisible by 9.

(d) In 50391, the sum of the digits is $5 + 0 + 3 + 9 + 1 = 18$, which is divisible by 9. So, 50391 is divisible by 9.

(e) In 8964, the sum of the digits is $8 + 9 + 6 + 4 = 27$, which is divisible by 9. So 8964 is divisible by 9.

(f) In 100090, the sum of the digits is $1 + 0 + 0 + 0 + 9 + 0 = 10$, which is not divisible by 9. So, 100090 is not divisible by 9.

(g) In 103081, the sum of the digits is $1 + 0 + 3 + 0 + 8 + 1 = 13$, which is not divisible by 9. So, 103081 is not divisible by 9.

(h) In 50391, the sum of the digits is $(5 + 0 + 3 + 9 + 1) = 18$, which is divisible by 9. So, 50391 is divisible by 9.

(i) In 20834, the sum of the digits is $2 + 0 + 8 + 3 + 4 = 17$, which is not divisible by 9. So, 20834 is not divisible by 9.

Divisibility test for 10 :

(a) The number 3522 is not divisible by 10 because its ones digit is not 0.

(b) The number 756 is not divisible by 10 because its ones digit is not 0.

(c) The number 21335 is not divisible by 10 because its ones digit is not 0.

(d) The number 50391 is not divisible by 10 because its ones digit is not 0.

(e) The number 8964 is not divisible by 10 because its ones digit is not 0.

(f) The number 100090 is divisible by 10 because its ones digit is 0.

(g) The number 103081 is not divisible by 10 because its ones digit is not 0.

(h) The number 50391 is not divisible by 10 because its ones digit is not 0.

(i) The number 20834 is not divisible by 10 because its ones digit is not 0.

Divisibility test for 11 :

(a) In number 3522, the sum of the digits at odd places is $3 + 5 = 8$. The sum of the digits at even places is $5 + 2 = 7$. Their difference is $8 - 7 = 1$, which is not 0 or multiple of 11. So, the number is not divisible by 11.

(b) In number 756, the sum of the digits at odd places is $7 + 6 = 13$. The sum of the digits at even places is 5. Their difference is $13 - 5 = 8$, which is not 0 or multiple of 11. So, the number is not divisible by 11.

(c) In the number 21335, the sum of the digits at odd places is $2 + 3 + 5 = 10$. The sum of the digits at even places is $1 + 3 = 4$. Their difference is $10 - 4 = 6$, which is not 0 or multiple of 11. So, the number is not divisible by 11.

(d) In number 50391, the sum of the digits at odd places is 5 + 3 + 1 = 9. The sum of the digits at even places is 0 + 9 = 9. Their difference is 9 – 9 = 0. So, the number 50391 is divisible by 11.

(e) In number 8964, the sum of the digits at odd places is 8 + 6 = 14. The sum of the digits at even places is 9 + 4 = 13. Their difference is 14 – 13 = 1, which is not 0 or multiple of 11. So, the number is not divisible by 11.

(f) In number 100090, the sum of the digits at odd places is 1+ 0 + 0 + 9 = 10. The sum of the digits at even places is 0 + 0 + 0 = 0. Their difference is 10 – 0 = 10, which is not 0 or multiple of 11. So, the number is not divisible by 11.

(g) In number 103081, the sum of the digits at odd places is 1 + 3 + 8 = 12. The sum of the digits at even places is 0 + 0 + 1 = 1. Their difference is 12 – 1 = 11. So, the number 103081 is divisible by 11.

(h) In number 50391, the sum of the digits at odd places is 5 + 3 + 1 = 9. The sum of the digits at even places is 0 + 9 = 9. Their difference is 9 – 9 = 0, so, the number 50391 is divisible by 11.

(i) In number 20834, the sum of the digits at odd places is 2 + 8 + 4 = 14. The sum of the digits at even places is 0 + 3 = 3. Their difference is 14 – 3 = 11. So, the number 20834 is divisible by 11.

2. Divisibility test for 2 :

(a) 652 is divisible by 2, because its ones digit is even.

(b) 4896 is divisible by 2, because its ones digit is even.

(c) 37780 is divisible by 2, because its ones digit is even.

(d) 5086 is divisible by 2 because its ones digit is even.

(e) 19334 is divisible by 2 because its ones digit is even.

(f) 21084 is divisible by 2 because its ones digit is even.

Divisibility test for 4 :

(a) 652 is divisible by 4. Since the last two digits of the numbers, i.e., 52 is divisible by 4.

(b) 4896 is divisible by 4. Since the last two digits of the numbers, i.e., 96 is divisible by 4.

(e) 37780 is divisible by 4. Since the last two digits of the numbers, i.e., 80 is divisible by 4.

(d) 5086 is not divisible by 4. Since the last two digits of the numbers i.e., 86 is not divisible by 4.

(e) 19334 is not divisible by 4. Since the last two digits of the numbers, i.e., 34 is not divisible by 4.

(f) 21084 is divisible by 4. Since the last two digits of the number, i.e., 84 is divisible by 4.

Divisibility test for 8 :

(a) In 652, the last three digits are 652, which is not divisible by 8. So, the number 652 is not divisible by 8.

(b) In 4896, the last three digits are 896, which is divisible by 8. So, the number 4896 is divisible by 8.

(c) In 37780, the last three digits are 780, which is not divisible by 8. So, the number 37780 is not divisible by 8.

(d) In 5086, the last three digits are 086, which is not divisible by 8. So, the number 5086 is not divisible by 8.

(e) In 19334, the last three digits are 334, which is not divisible by 8. So, the number 19334 is not divisible by 8.

(f) In 21084, the last three digits are 084, which is not divisible by 8. So, the number 21084 is not divisible by 8.

3. (a) We know that a number is divisible by 3 only if the sum of its digits is divisible by 3.

Here, 4 + 1 + 2 + 9 = 16, if we add the least number 2, the sum (16 + 2) 18 is divisible by 3.

Hence, the required smallest digit is 2.

(b) We know that a number is divisible by 2, if its ones place digit is divisible by 2 or it is 0. Hence, its ones place digit must be 0, 2, 4, 6 or 8. Therefore, the smallest digit to replace * in the given number is 0.

(c) We know that a number is divisible by 2 if its ones place digit is divisible by 2 or it is 0. Hence, its ones plaec digit must be 0, 2, 4, 6 or 8. Therefore, the smallest digit to replace *in the given number is 0. And the sum of digit $= 7 + 1 + 5 + 8 + 0 = 21$ which is divisible by 3. So, the required number is 0.

(d) We know that a number is divisible by 4, only if the number form by its last two digits is divisible by 4 or last two digits are zero. Clearly, the smallest digit is 1 so that 12 is divisible by 4.

(e) We know that a number is divisible by 10, only if the number form by its last digits is zero. Clearly, the smallest digit is 0.

(f) We know that a number is divisible by 9, only if the sum of its digits is divisible by 9. Here, $6 + 5 + 1 + 1 + 2 = 15$. Clearly, 3 is the required smallest digit so that 18 is divisible by 9.

(g) We know that a number is divisible by 8, only if the number formed by its last three digits is divisible by 8 or last three digits are zeros. Clearly, the smallest digit is 2 so that 728 is divisible by 8.

(h) We know that a number is divisible by 11, if the difference of the sums of alternate digits is either 0 or divisible by 11.

Here, we have $(2 + 5 + 1 + 3) - (1 + * + 7)$

$= 11 - 8 - * = 3 - *$. Clearly, 3 is the required number to make it divisible by 11.

(i) We know that a number is divisible by 5, only if its ones digits is either 0 or 5. Hence, 0 is the smallest digit for the required places in the given number.

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

5. (a) Here, $39 < 6 \times 6$

By using divisibility test, we see that 39 is divisible by 3, so 39 is not a prime number.

(b) Here, $193 < 14 \times 14$

By using divisibility test, we see that 193 is not divisible by 2, 3, 5, 7 and 11. Also, 193 is not divisible by 13. So, 193 is a prime number.

(e) Here, $307 < 17 \times 17$

By using divisibility test, we see that 307 is not divisible by 2, 3, 5, 7, 11 and 13. So, 307 is a prime number.

(d) Here, $327 < 18 \times 18$

By using divisibility test we see that 327 is divisible by 3. So, 327 is not a prime number.

(e) Here, $283 < 16 \times 16$

By using divisibility test, we see that 283 is not divisibility by 2, 3, 5, 7, and 11. Also, 283 is not divisible 13. So, 283 is a prime number.

(f) Here, $129 < 11 \times 11$

By using divisibility test, 129 is divisible by 3. So, 129 is not a prime number.

(g) Here, $397 < 19 \times 19$

By using divisibility test, we see that 397 is not divisible by 2, 3, 5, 7 and 11. Also, 397 is not divisible by 13, 17. So, 397 is a prime number.

(h) Here, $187 < 13 \times 13$

187 is divisible by 11. So, 187 is not a prime number.

6. (a) 2, 3, 5, 7 and 11, Since, 137 is not divisible by any of these numbers, so it is a prime number.

(b) 2, 3, 5, 7, 11 and 13. Since, 203 is divisible by 7, so it is not a prime number.

(c) 2, 3, 5, 7, 11 and 17. Since, 317 is not divisible by any of these numbers, so it is a prime number.

(d) 2, 3, 5, 7, 11, 13, 17 and 19. Since, 407 is divisible by 11, so it is not a prime number.

Exercise 5.3

1. (a)

945
3 × 315
3 × 105
3 × 35
5 × 7

∴ The prime factor of

$945 = 3 \times 3 \times 3 \times 5 \times 7$

(b)

3502
2 × 1751
17 × 103

∴ The prime factor of

$3502 = 2 \times 17 \times 103$

(c)

2907
3 × 969
3 × 323
17 19

∴ The prime factor of $2907 = 3 \times 3 \times 17 \times 19$

2. **Prime Factorization :** The process of expressing a number as a product of only prime factors is called prime factorization.

For example : 1 and the prime number itself.

3. No.

4. (a)

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

Thus, $216 = 2 \times 2 \times 2 \times 3 \times 3 \times 3$.

(b)

3	2121
7	707
10	101
	1

Thus, $2121 = 3 \times 7 \times 101$.

(c)

7	1729
13	247
19	19
	1

Thus, $1729 = 7 \times 13 \times 19$.

(d)

3	1197
3	399
7	133
19	19
	1

Thus, $1197 = 3 \times 3 \times 7 \times 19$.

(e)

2	12000
2	6000
2	3000
2	1500
2	750

→

3	375
5	125
5	25
5	5
	1

Thus, $12000 = 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 5 \times 5 \times 5$.

(f)

2	20570
5	10285
11	2057
11	187
11	17
	1

Thus, $20570 = 2 \times 5 \times 11 \times 11 \times 17$.

5. The smallest six digit number $= 100000$

2	100000
2	50000
2	25000
2	12500
2	6250
5	3125

→

5	625
5	125
5	25
5	5
	1

Thus, $100000 = 2 \times 2 \times 2 \times 2 \times 2 \times 5 \times 5 \times 5 \times 5 \times 5$

6. The greatest four-digit number = 9999

3	9999
3	3333
11	1111
101	101
	1

Thus, $9999 = 3 \times 3 \times 11 \times 101$.

7. (a) The HCF of 36 and 84.

2	36
2	18
3	9
3	3
	1

2	84
2	42
3	21
7	7
	1

The prime factors of 36 are $\boxed{2} \times \boxed{2} \times \boxed{3} \times 3$

The prime factors of 84 are $\boxed{2} \times \boxed{2} \times \boxed{3} \times 7$

HCF = Product of common prime factors $= 2 \times 2 \times 3 = 12$

$\therefore$ HCF of 36 and 84 is 12.

(b) The HCF of 44 and 110.

2	44
2	22
11	11
	1

2	110
5	55
11	11
	1

The prime factors of 44 are $\boxed{2} \times 2 \times \boxed{11}$

The prime factors of 110 are $\boxed{2} \times 5 \times \boxed{11}$

HCF = Product of common prime factors $= 2 \times 11 = 22$

$\therefore$ HCF of 44 and 110 is 22.

(c) The HCF of 117 and 81.

3	117
3	39
13	13
	1

3	81
3	27
3	9
3	3
	1

The prime factors of 117 are $\boxed{3} \times \boxed{3} \times 13$

The prime factors of 81 are $\boxed{3} \times \boxed{3} \times 3 \times 3 \times 3$

HCF = Product of common prime factors $= 3 \times 3 = 9$

$\therefore$ HCF of 117 and 81 is 9.

(d) The HCF of 70, 35 and 49.

2	70
5	35
7	7
	1

5	35
7	7
	1

7	49
7	7
	1

The prime factors of 70 are $2 \times 5 \times \boxed{7}$

The prime factors of 35 are $5 \times \boxed{7}$

The prime factors of 49 are $\boxed{7} \times 7$

HCF = Product of common prime factors = 7

$\therefore$ HCF of 70, 35 and 49 is 7.

(e) The HCF of 234, 519 and 78.

2	234
3	117
3	39
13	13
	1

3	519
173	173
	1

2	78
3	39
13	13
	1

The prime factors of 234 are 2 × 3 × 3 × 13

The prime factors of 519 are 3 × 173

The prime factors of 78 are 2 × 3 × 13

HCF = Product of common prime factors = 3

∴ HCF of 234, 519 and 78 is 3.

(f) The HCF of 1794, 2346 and 4761

2	1794
3	897
13	299
23	23
	1

2	2346
3	1173
17	391
23	23
	1

3	4761
3	1587
23	529
23	23
	1

The prime factors of 1794 are $2 \times 3 \times 13 \times 23$

The prime factors of 2346 are $2 \times 3 \times 17 \times 23$

The prime factors of 4761 are $3 \times 3 \times 23 \times 23$

HCF = Product of common prime factors $= 3 \times 23 = 69$

∴ HCF of 1794, 2346 and 4761 is 69.

8. (a) By continued division method.

```
161)325(
   -322
   ----------
      3)161(53
        159
        --------
         2)3(1
           2
         ---------
            1)2(2
              2
             ---
              ×
```

Hence, the HCF of 161 and 325 is 1.

(b) By continued division method.

```
345)506(1
   -345
   ----------
    161)345(2
       -322
       --------
         23)161(7
           -161
           -----
             ×
```

Hence, the HCF of 345 and 506 is 23.

(c) By continued division method.

615)1599(2
−1230
369)615(1
369
246)369(1
246
123)246(2
−246
×

Hence, the HCF of 615 and 1599 is 123.

(d) By continued division method.

4130)7021(1
−4130
2891)4130(1
−2891
1239)2891(2
−2478
413)1239(3
−1239
×

Hence, the HCF of 4130 and 7021 is 413.

(e) By continued division method.

Let us take two numbers 289 and 391.

289)391(1
−289
102)289(1
−204
85)102(2
−85
17)85(5
−85
×

Thus, HCF of 289 and 391 is 17.

Let us now find the HCF of the third number 884 and 17.

By continued division method.

17)884(52
−884
×

The HCF of 17 and 884 is 17.

Hence, the required HCF of 289, 391 and 884 is 17.

(f) By continued division method.

Let us take two numbers 2103 and 9216.

```
2103) 9216 (4
     –8412
      804) 2103 (2
          –1608
            495) 804 (1
                –495
                  309) 495 (1
                      –309
                        186) 309 (1
                              186
                           123) 186 (1
                               –123
                                  63) 123 (1
                                       63
                                     60) 63 (1
                                         60
                                        3) 60 (20
                                          –60
                                           ×
```

The HCF of 2103 and 9216 is 3.

Let us now find the HCF of the third number 9945 and 3.

```
3) 9945 (3315
  – 9945
      ×
```

The HCF of 9945 and 3 is 3.

Hence, the required HCF of 2103, 9945 and 9216 is 3.

9. Since 4, 5 and 6 are the remainder when 445, 572 and 699 are divided by the required number.

∴ $445 - 4 = 441$, $572 - 5 = 567$ and $699 - 6 = 693$.

```
441) 567 (1
     441
     126) 441 (3
         –378
           63) 126 (2
               126
                ×
```

The HCF of 441 and 567 is 63.

Let us now find the HCF of the third number 693 and 63.

```
63) 693 (11
   –693
     ×
```

HCF of 441, 567 and 693 is 63.

Hence, the required largest number is 63.

10. Since, 5 and 6 are remainder when 719 and 930 are divided by the required number.

$\therefore$ 719 – 5 = 714 and 930 – 6 = 924 are completely divisible by the required number.

Thus, the required number must be the HCF of 714 and 924.

```
714)924(1
   –714
   ----------
     210)714(3
        –630
        ---------
          84)210(
            –168
            -------
              42)84(2
                 84
               ------
                  ×
```

HCF of 714 and 424 is 42.

Hence, the required largest number is 42.

11. Since, 5 is the remainder when 2273, 1823 and 977 are divided by the required.

$\therefore$ 2273 – 5 = 2268, 1823 – 5 = 1818 and 977 – 5 = = 972 are completely divisible by the required number.

Thus, the required number must be the HCF of 2268, 1818 and 972.

Let us take two numbers are 2268 and 1818.

```
1818)2268(1
    –1818
   -----------
      450)1818(4
          –1800
          ---------
             18)450(25
                –450
                -----
                  ×
```

The HCF of 1818 and 2268 is 18.

Let us now find the HCF of the third number 972 and 18 are completely divisible by the required number.

```
18)972(54
   –972
   -----
     ×
```

The HCF of 972 and 18 is 18.

Hence, the required largest number is 18.

12. First we find the HCF of 180 and 192.

$$\begin{array}{l} 180\,)\,192\,(\,1 \\ \quad -180 \\ \hline \quad\quad 12\,)\,180\,(\,15 \\ \quad\quad\quad -180 \\ \hline \quad\quad\quad\quad \times \end{array}$$

12 m can be used to measure exactly 180 metre and 192 metres.

13. Length of the room = 6 m 30 cm or 630 cm.

Breadth of the room = 5 m 85 cm or 585 cm.

Largest size of each till will be the HCF of 630 m and 585 cm.

$$\begin{array}{l} 585\,)\,630\,(\,1 \\ \quad -585 \\ \hline \quad\quad 45\,)\,585\,(\,13 \\ \quad\quad\quad -585 \\ \hline \quad\quad\quad\quad \times \end{array}$$

HCF of 630 cm and 585 cm is 45 cm.

So, the largest size of the square tile is 45 cm.

$$\text{Least number of square tiles} = \frac{\text{Area of floor}}{\text{Area of a tile}}$$

$$= \frac{630 \times 585}{45 \times 45} = 182 \text{ tiles}$$

Hence least number of tiles required 182.

14. To find the longest tape which can measure the three dimensions of the room exactly, we need to find the HCF of 825, 675 and 450.

All possible prime factors of $825 = 3 \times 5 \times 5 \times 11$

Al possible prime factors of $675 = 3 \times 3 \times 3 \times 5 \times 5$

All possible prime factors of $450 = 2 \times 3 \times 3 \times 5 \times 5$

The common factors of 825, 675 and 450 are 3, 5 and 5.

Therefore, HCF of 825, 675 and $450 = 3 \times 5 \times 5 = 75$

Hence, the longest tape that can measure the three dimensions exactly is 75 cm long.

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

(a) We find the HCF of 65 and 91.

65) 91 (1
–65
26) 65 (2
–52
13) 26 (2
26
×

So, the HCF of 65 and 91 is 13.

Now, dividing the numerator and the denominator by 13. $\frac{65}{91} = \frac{65 \div 13}{91 \div 13} = \frac{5}{7}$

Hence, lowest term is $\frac{5}{7}$.

(b) We find the HCF of 289 and 408.

289) 408 (1
–289
119) 289 (2
–238
51) 119 (2
102
17) 51 (3
51
×

So, the HCF of 289 and 408 is 17.

Now, dividing the numerator and the denominator by 17. $\frac{289}{408} = \frac{289 \div 17}{408 \div 17} = \frac{17}{24}$

Hence, lowest term is $\frac{17}{24}$.

(c) We find the HCF of 399 and 437.

399) 437 (1
–399
38) 399 (10
–380
19) 38 (2
38
×

So, the HCF of 399 and 437 is 19.

Now, dividing the numerator and the denominator by 19. $\frac{399}{437} = \frac{399 \div 19}{437 \div 19} = \frac{21}{23}$.

Hence lowest term is $\frac{21}{23}$.

(d) We find the HCF of 623 and 833.

623) 833 (1
–623
210) 623 (2
–420
203) 210 (1
–203
7) 203 (3
–203
×

So, the HCF of 623 and 833 is 7.

Now, dividing the numerator and the denominator by 7. $\frac{623}{833} = \frac{623 \div 7}{833 \div 7} = \frac{89}{119}$

Hence, lowest term is $\frac{89}{119}$.

Exercise 5.4

1. By prime factorisation method :

(a)

2	32
2	16
2	8
2	4
2	2
	1

2	36
2	18
3	9
3	3
	1

2	40
2	20
2	10
5	5
	1

$32 = 2 \times 2 \times 2 \times 2 \times 2$, $36 = 2 \times 2 \times 3 \times 3$, $40 = 2 \times 2 \times 2 \times 5$

Required LCM of 32, 36 and 40 = Product of all different prime factors with its greatest exponent

$= 2^5 \times 3^2 \times 5 = 1440$

(b)

3	3
	1

2	4
2	2
	1

5	5
	1

2	6
3	3
	1

7	7
	1

2	8
2	4
2	2
	1

$3 = 3$, $4 = 2 \times 2$, $5 = 5$, $6 = 2 \times 3$ $7 = 7$, $8 = 2 \times 2 \times 2$

Required LCM of 3, 4, 5, 6, 7 and 8 = Product of all different prime factors with its greatest exponent

$= 3 \times 2^3 \times 7 \times 5 = 840$

(c)

2	112
2	56
2	28
2	14
7	7
	1

2	168
2	84
2	42
3	21
7	7
	1

2	266
7	133
19	19
	1

$112 = 2 \times 2 \times 2 \times 2 \times 7, 168 = 2 \times 2 \times 2 \times 3 \times 7, 266 = 2 \times 7 \times 19$

Required LCM of 112, 168 and 266 = Product of all different Prime factors with its greatest exponent

$= 2^4 \times 3 \times 7 \times 19 = 6384$

(d)

2	180
2	90
3	45
3	15
5	5
	1

2	384
2	192
2	96
2	48
2	24
2	12
2	6
3	3
	1

2	144
2	72
2	36
2	18
3	9
3	3
	1

$180 = 2^2 \times 3^2 \times 5,\ 384 = 2^7 \times 3,\ 144 = 2^4 \times 3^2$

Required LCM of 180, 384 and 144 = Product of all different prime factors with its greatest exponent

$= 2^7 \times 3^2 \times 5 = 5760$

(e)

2	162
3	81
3	27
3	9
3	3
	1

2	132
2	66
3	33
11	11
	1

2	108
2	54
3	27
3	9
3	3
	1

$162 = 2 \times 3^4,\ 132 = 2^2 \times 3 \times 11,\ \ 108 = 2^2 \times 3^3$

Required LCM of 162, 132 and 108 = Product of all different prime factors with its greatest exponent

$= 2^2 \times 3^4 \times 11 = 3564$

(f)

2	108
2	54
3	27
3	9
3	3
	1

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

2	72
2	36
2	18
3	9
3	3
	1

2	54
3	27
3	9
3	3
	1

2	36
2	18
3	9
3	3
	1

$108 = 2^2 \times 3^3, 96 = 2^5 \times 3, 72 = 2^3 \times 3^2, 54 = 2 \times 3^3, \ 36 = 2^2 \times 3^2$

Required LCM of 108, 96, 72, 54 and 36 = Product of all different prime factors exponent $= 2^5 \times 3^3 = 864$

2. (a)

2	20, 24, 45
2	10, 12, 45
2	5, 6, 45
3	5, 3, 45
3	5, 1, 15
5	5, 1, 5
	1, 1,1

$\therefore$ LCM of 20, 24 and 45 is $2 \times 2 \times 2 \times 3 \times 3 \times 5 = 360$

(b)

2	56, 70
2	28, 35
2	14, 35
5	7, 35
7	7, 7
	1, 1

$\therefore$ LCM of 56 and 70 is $2 \times 2 \times 2 \times 5 \times 7 = 280$

(c)

2	660, 420, 240
2	330, 210, 120
2	165, 105, 60
2	165, 105, 30
3	165, 105, 15
5	55, 35, 5
7	11, 7, 1
11	11, 1, 1
	1, 1, 1

(d)

2	24, 19, 40, 60
2	12, 19, 20, 30
2	6, 19, 10, 15
3	3, 19, 5, 15
5	1, 19, 5, 5
19	1, 19, 1, 1
	1, 1, 1, 1

∴ LCM of 660, 420, 240 is $2 \times 2 \times 2 \times 2 \times 3 \times 5 \times 7 \times 11 = 18480$

∴ LCM of 24, 19, 40 and 60 is $2 \times 2 \times 2 \times 3 \times 5 \times 19 = 2280$

(e)

2	9, 12, 15, 18, 24
2	9, 6, 15, 9, 12
2	9, 3, 15, 9, 6
3	9, 3, 15, 9, 3
3	3, 1, 5, 3, 1
5	1, 1, 5, 1, 1
	1, 1, 1, 1, 1

∴ LCM of 9, 12, 15 and 18 and 24 is $2 \times 2 \times 2 \times 3 \times 3 \times 5 = 360$

(f)

2	5, 10, 12, 15, 18, 25, 30
2	5, 5, 6, 15, 9, 25, 15
3	5, 5, 3, 15, 9, 25, 15
3	5, 5, 1, 5, 3, 25, 5
5	5, 5, 1, 5, 1, 25, 5
5	1, 1, 1, 1, 1, 5, 1
	1, 1, 1, 1, 1, 1, 1

∴ LCM of 5, 10, 12, 15, 18, 25 and 30 is $2 \times 2 \times 3 \times 3 \times 5 \times 5 = 900$

3. We know that the smallest number is the LCM of 112, 140 and 168.

2	112, 140, 168
2	56, 70, 84
2	28, 35, 42
2	14, 35, 21
5	7, 35, 21
3	7, 7, 21
7	7, 7, 7
	1, 1, 1

The LCM of112, 140 and 91

∴ The required LCM is
$2 \times 2 \times 2 \times 2 \times 5 \times 3 \times 7 = 1680$

Hence, the required number
$= 1680 + 8 = 1688$

4. We first find the LCM of 9, 12, 15, 18 and 24.

2	9, 12, 15, 18, 24
2	9, 6, 15, 9, 12
2	9, 3, 15, 9, 6
3	9, 3, 15, 9, 3
3	3, 1, 5, 3, 1
5	1, 1, 5, 1, 1
	1, 1, 1, 1, 1

```
360) 99999 (277
    -720
     2799
    -2520
      2799
     -2520
       279
```

$\text{LCM} = 2 \times 2 \times 2 \times 3 \times 3 \times 5 = 360$

Now, greatest number of 5-digits = 99999

We find that when 99999 is divided by 360, the remainder is 279.

So, the greatest number of 5-digits exactly divisible by 9, 12, 15, 18 and 24 is $99999 - 279 = 99720$.

Hence, the required number = 99720.

5. We first find the LCM of 12, 18, 20, 21, 28 and 30.

2	12, 18, 20, 21, 28, 30
2	6, 9, 10, 21, 14, 15
3	3, 9, 5, 21, 7, 15
3	1, 3, 5, 7, 7, 5
5	1, 1, 5, 7, 7, 5
7	1, 1, 1, 7, 7, 7, 1
	1, 1, 1, 1, 1, 1

LCM of the given numbers

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

$= 1260$

Hence, the required number

$= 1260 + 35 = 1295$

6. We first find the LCM of 7, 15, 20, 21, 28, 30 and 35.

2	7, 15, 20, 21, 28, 30, 35
2	7, 15, 10, 21, 14, 15, 35
3	7, 15, 5, 21, 7, 15, 35
5	7, 5, 5, 7, 7, 5, 35
7	7, 1, 1, 7, 1, 1, 7
	1, 1, 1, 1, 1, 1, 1

LCM of the given numbers

$= 2 \times 2 \times 3 \times 5 \times 7 = 420$

Hence, LCM of 7, 15, 20, 21, 28, 30 and 35 is 420.

7. Required time = LCM of 12, 16 and 24 minutes.

2	12, 16, 24
2	6, 8, 12
2	3, 4, 6
2	3, 2, 3
3	3, 1, 3
	1, 1, 1

So, LCM of 12, 16 and 24 $= 2 \times 2 \times 2 \times 2 \times 3 = 48$ minutes.

So, all the bells will toll together again after 48 minutes i.e., after 8 : 48 am.

8. To find the minimum value of weight which can measure bags of 250 g, 400 g and 500 g exact number of times, we need to find the LCM of 250, 400, 500.

2	250, 400, 500
2	125, 200, 250
2	125, 100, 125
2	125, 50, 125
5	125, 25, 125
5	25, 5, 25
5	5, 1, 5
	1, 1, 1

$\therefore$ LCM of 250, 400, 500 $= 2\times 2\times 2\times 2\times 5\times 5\times 5 = 2000$ g $= 2$ kg

Hence, the minimum value of weight required to measure the bag is 2 kg.

9. First we find the LCM of 35, 40 and 25.

2	35, 40, 25
2	35, 20, 25
2	35, 10, 25
5	35, 5, 25
5	7, 1, 5
7	7, 1, 1
	1, 1, 1

$\therefore$ LCM of 35, 40 and 25 $= 2\times 2\times 2\times 5\times 5\times 7 = 1400$

Hence, 1400 books are required for the class library for equal distribution in section A, B and C.

10. We first find the LCM of 9, 12, 45, 54 and 72.

2	9, 12, 45, 54, 72
2	9, 6, 45, 27, 36
2	9, 3, 45, 27, 18
3	9, 3, 45, 27,9
3	3, 1, 15, 9, 3
3	1, 1, 5, 3, 1
5	1, 1, 3, 1, 1
	1, 1, 1, 1, 1

1080) 10000 (9
−9720
280

LCM $= 2\times 2\times 2\times 3\times 3\times 3\times 5 = 1080$

Now, smallest number five-digits $= 10000$

We find that when 10000 is divided by 1080, the remainder is 280.

So, least number of 5-digits exactly divisible by 9, 12, 45, 54 and is

$(10000 - 280) + 1080 = 10800$

Hence, the required number is 10800.

11. We know that the smallest number is the LCM of 63, 12 and 84.

2	63, 12, 84
2	63, 6, 42
3	63, 3, 21
3	21, 1, 7
7	7, 1, 7
	1, 1, 1

The LCM of 63, 12 and 84.

$\therefore$ The required LCM is

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

Hence, the required number $= 252 + 7 = 259$

12. First we find the LCM of 16, 28, 40 and 56.

2	16, 28, 40, 72
2	8, 14, 20, 28
2	4, 7, 10, 4
2	2, 7, 5, 7
5	1, 7, 5, 7
7	1, 7, 1, 7
	1, 1, 1, 1

5040) 10000 (1
−5040
4960

LCM $= 2 \times 2 \times 2 \times 2 \times 5 \times 7 = 560$

We find that when 10000 is divided by 560, the remainder is 480.

So, the two numbers nearest to 10000 are $[(10000 - 480)]$, $[(10000 + 480) + 560] = 9520, 10080.$

Hence, the required numbers are 9520, 10080.

Exercise 5.5

1. (a) First we find the HCF of 24 and 36.

$$
\begin{array}{l}
24\overline{)36}(1 \\
\quad -24 \\
\quad \overline{\quad 12)24}(2 \\
\qquad\quad -24 \\
\qquad\quad \overline{\quad\times\quad}
\end{array}
$$

$\therefore$ HCF of 24 and 36 is 12.

$$\text{LCM} = \frac{\text{Product of two numbers}}{\text{Their HCF}} = \frac{24 \times 36}{12} = 72$$

(b) First we find the HCF of 108 and 96.

$$
\begin{array}{l}
96\overline{)108}(1 \\
\quad -96 \\
\quad \overline{\quad 12)96}(8 \\
\qquad\quad -96 \\
\qquad\quad \overline{\quad\times\quad}
\end{array}
$$

$\therefore$ HCF of 108 and 96 is 12.

$$\text{LCM} = \frac{\text{Product of two numbers}}{\text{Their HCF}} = \frac{108 \times 96}{12} = 864$$

(c) First we find the HCF of 145 and 232.

$$
\begin{array}{l}
145\overline{)232}(1 \\
\quad -145 \\
\quad \overline{\quad 87)145}(1 \\
\qquad\quad -87 \\
\qquad\quad \overline{\quad 58)87}(1 \\
\qquad\qquad\quad 58 \\
\qquad\qquad\quad \overline{\quad 29)58}(2 \\
\qquad\qquad\qquad\quad -58 \\
\qquad\qquad\qquad\quad \overline{\quad\times\quad}
\end{array}
$$

$\therefore$ HCF of 145 and 232 is 29.

$$\text{LCM} = \frac{\text{Product of two numbers}}{\text{Their HCF}} = \frac{145 \times 232}{29} = 1160$$

(d) First we find the HCF of 861 and 1353.

$$
\begin{array}{l}
861\overline{)1353}(1 \\
\quad -861 \\
\quad \overline{492)861}(1 \\
\qquad -492 \\
\qquad \overline{\quad 369)492}(1 \\
\qquad\qquad -369 \\
\qquad\qquad \overline{\quad 123)369}(3 \\
\qquad\qquad\qquad -369 \\
\qquad\qquad\qquad \overline{\quad x\quad}
\end{array}
$$

$\therefore$ HCF of 861 and 1353 is 123.

$$\text{LCM} = \frac{\text{Product of two numbers}}{\text{Their HCF}} = \frac{861 \times 1353}{123} = 9471$$

(e) First we find the HCF of 450 and 1150.

```
450)1150(1
    -900
    ----
     250)450(1
        -250
        ----
         200)250(1
            -200
            ----
              50)200(4
                -200
                ----
                  ×
```

∴ HCF of 450 and 1150 is 50.

$$\text{LCM} = \frac{\text{Product of two numbers}}{\text{Their HCF}} = \frac{450 \times 1150}{50} = 10350$$

(f) First we find the HCF of 720 and 1296.

```
720)1296(1
    -720
    ----
     576)720(1
        -576
        ----
         144)576(4
            -576
            ----
              ×
```

∴ HCF of 720 and 1296.

$$\text{LCM} = \frac{\text{Product of two number}}{\text{Their HCF}} = \frac{720 \times 1296}{144} = 6480$$

2. HCF = 89, LCM = 1335

One number = 267

Other number = ?

$$\text{The other number} = \frac{\text{HCF} \times \text{LCM}}{\text{One number}} = \frac{89 \times 1335}{267} = 445$$

3. HCF = 13, LCM = 1989 and one number = 117

Other number = ?

$$\text{Other number} = \frac{\text{HCF} \times \text{LCM}}{\text{One number}} = \frac{13 \times 1989}{117} = 221$$

4. Product of two numbers = 7623

$$HCF = 11$$
$$LCM = ?$$

$\because$ LCM × HCF = Product of the numbers

$$LCM \times 11 = 7623$$
$$LCM = 7623/11$$
$$LCM = 693$$

MCQs : 1. (b) 2. (c) 3. (a) 4. (c) 5. (d) 6. (b)

Mental Maths :

1. (a) A natural number greater than 1, which has no factor other than 1 and itself is called a **prime** number.

(b) Write the prime numbers between 20 and 30 **23 and 29.**

(c) The product H.C.F. and L.C.M. of two numbers is equal to the **product of two number.**

(d) The H.C.F. of two co-prime numbers is **1.**

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

Chapter 6 Perimeter and Area

Exercise 6.1

1. (a) Perimeter of the given figure $= (1 + 1.5 + 2.5)$ cm = 5 cm

(b) Perimeter of the given figure $= (7 + 9 + 6)$ cm = 22 cm

(c) Perimeter of the given figure $= (8 + 8 + 8)$ cm = 24 cm

(d) Perimeter of the given figure $= (12 + 12 + 6)$ cm = 30 cm

2. (a) The perimeter of the given figure

$= (5 + 5 + 5 + 6 + 9 + 5 + 9 + 6)$ cm = 50 cm

(b) The perimeter of the given figure

$= (6 + 1 + 2 + 3 + 2 + 1 + 6 + 1 + 2 + 3 + 2 + 1)$ cm = 30 cm

(c) The perimeter of the given figure = (4 + 4 + 4 + 4 + 4 + 4 + 4 + 4 + 4 + 4 +4 + 4) m = 48 cm

(d) The perimeter of the given figure

$= (1 + 2 + 1 + 2 + 1 + 2 + 1 + 2 + 4 + 8)$ cm

$= 24$ cm

(e) The perimeter of the given figure $= (3 + 3 + 4 + 4 + 4)$ m

$= 18$ m

3. Since, the perimeter of a square $= 4 \times$ side

So, (a) The perimeter of a square $= 4 \times 9$ cm $= 36$ cm

(b) The perimeter of a square $= 64$ m

$4 \times$ side $= 64$ m

side $= (64 \div 4)$ m $= 16$ m

(c) The perimeter of a square $= 4 \times$ side

$= 4 \times 19.5$ cm $= 78$ cm

(d) The perimeter of a square $= 4 \times$ side

$4 \times$ side $= 120$ cm

side $= (120 \div 4)$ cm $= 30$ m

4. Since, the perimeter of a rectangle $= 2(l + b)$

So, (a) The perimeter of given figure $= 2(10 + 5)$ cm

$= 2 \times 15$ cm $= 30$ cm

(b) The perimeter of given figure $= 2(15 + 12)$ cm

$= 2 \times 27$ cm $= 54$ cm

Since, the perimeter of a square $= 4 \times$ side

So, (c) The perimeter of given figure 4×25 cm $= 100$ cm

(d) The perimeter of given figure $= 2(50 + 20)$ cm $= 140$ cm

5. One side of the square $= 30$ cm

So, the perimeter of a square $= 4 \times$ side

$= 4 \times 30$ cm

$= 120$ cm

6. The perimeter of the square = 36 m

So, the side of the square = perimeter ÷ 4

$= 36 \div 4 = 9$ m

7. The side of a square field = 25 m

So, the perimeter of a square $= 4 \times$ side

$= 4 \times 25$ m $= 100$ m

So, the cost of fencing a square field = ₹ $100 \times 10.50 =$ ₹ 10.50

8. Length of a rectangular park = 615 m

Breadth of a rectangular park = 550 m

Perimeter of the field = 2 (length + breadth)

$= 2(615 + 550)$ m $= 2 \times 1165$ m $= 2330$ m

$\because$ Cost of fencing 1 m = ₹ 9.25

$\therefore$ Cost of fencing 2330 m = ₹ $9.25 \times 2330 =$ ₹ 21552.50

9. Length of a piece of wire = 78 m

Since, length of a piece of wire = Perimeter of a regular pentagon

So, $5 \times$ side = 78 m

side $= (78 \div 5)$ m $= 15.6$ m

Similarly, the side of hexagon $= (78 \div 6)$ m $= 13$ m

Thus, the difference in the lengths of its sides

$= 15.6$ m $- 13$ m $= 2.6$ m.

10. The perimeter of equilateral triangle = 3 m 12 cm = 3.12 m

or 3.12×100 cm = 312 cm

So, the length of a side of an equilateral triangle $= (312 \div 3)$cm

= 104 cm = 1 m 4 cm

11. The perimeter of the square park $= 4 \times 135$ m $= 540$ m

Distance covered by Shyam in 2 rounds $= 2 \times 540$ m

$= 1080$ m

The perimeter of a rectangular park $= 2(70 + 45)$ m $= 230$ m

Distance covered by Seema in 3 rounds

$= 3 \times 230$ m $= 690$ m

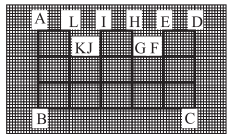
Since, 1080 m > 690 m

So, their difference $= (1080 - 690)$ m $= 390$ m

Hence, Shyam covers more distance and by 390 m.

Exercise 6.2

1. (a) Number of complete squares enclosed = 13



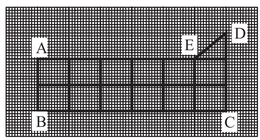
Number of more than half square enclosed = 0

Number of half squares enclosed = 0

So, area of (ABCDEFGHIJKL) $= 13 \times 1 + 0 \times 1 + 0 \times 1$

$= 13 \text{ cm}^2$

(b) Number of complete square enclosed = 12



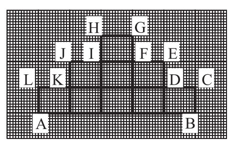
Number of more than half square enclosed = 0

Number of half squares enclosed = 1

So, area of (ABCDE) $= 12 \times 1 + 0 \times 1 + \frac{1}{2} \times 1 = 12 + 0 + \frac{1}{2}$

$= 12\frac{1}{2} \text{ cm}^2$

(c) Number of complete squares enclosed = 9



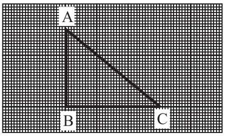
Number of more than half square enclosed = 0

Number of half squares enclosed = 0

So, area of (ABCDEFGHIJKL)

$= 9 \times 1 + 0 \times 1 + 0 \times 1 = (9 + 0 + 0) \text{ cm}^2 = 9 \text{ cm}^2$

(d) Number of complete squares enclosed = 3



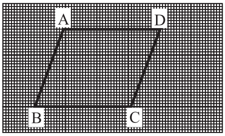
Number of more than half square enclosed = 0

Number of half squares enclosed = 3

So, area of (ABC) $= 3 \times 1 + 0 \times 1 + \frac{1}{2} \times 3 = \left(3 + 0 + \frac{3}{2}\right)$ cm^2

$$= \left(\frac{6+3}{2}\right) \text{cm}^2 = \frac{9}{2} \text{cm}^2 = 4.5 \text{ cm}^2$$

(e) Number of complete squares enclosed = 6



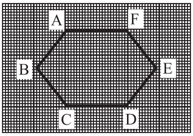
Number of more than half square enclosed = 4

Number of half squares enclosed = 0

So, Area of (ABCD) $= 6 \times 1 + 4 \times 1 + 0 \times \frac{1}{2}$

$$= (6 + 4 + 0) \text{ cm}^2 = 10 \text{ cm}^2$$

(f) Number of complete squares enclosed = 6



Number of more than half square enclosed = 2

Number of half squares enclosed = 0

So, Area of (ABCDEF) $= 6 \times 1 + 2 \times 1 + 0 \times \frac{1}{2}$

$= (6 + 2 + 0)$ cm^2 = 8 cm^2

2. (a) Length = 4 cm, Breadth = 3 cm, Area = ?, Perimeter = ?

So, area of rectangle = $l \times b = 4$ cm $\times$ 3 cm = 12 cm^2

And perimeter of rectangle = $2(l + b) = 2(4 + 3)$ cm = 14 cm

(b) Length = ? Breadth = 12 cm, Area = 240 cm^2

Perimeter = ?

Area of the rectangle $= l \times b$

$$240 = l \times 12 = 240 \div 12 = 20 \text{ cm}$$

And perimeter of the rectangle $= 2(l + b)$

$$= 2(20 + 12) \text{ cm} = 64 \text{ cm}$$

(c) Length = 5 cm, Breadth = 8.5 m, Area = ?, Perimeter = ?

So, area of the rectangle $= l \times b = 5 \times 8.5 \text{ cm}^2 = 42.5 \text{ cm}^2$

And perimeter of the rectangle $= 2(l + b) = 2(5 + 8.5) \text{ cm}$

$$= 27 \text{ cm}$$

The table are :

S.No.	Length	Breadth	Area	Perimeter
a	4 cm	3 cm	12 cm^2	14 cm
b	20 cm	12 cm	240 cm^2	64 cm
c	5 cm	8.5 cm	42.5 cm^2	27 cm

3. Length of a playground = 30 m

Breadth of a playground = 15 m

So, the area of a playground $= (30 \times 15) \text{ m}^2 = 450 \text{ m}^2$

$\because$ the cost of levelling per square metre = ₹ 3

$\therefore$ the cost of levelling 450 m^2 = ₹ 3×450 = ₹ 1350

4. Length of a rectangle = 5 cm

Breadth of a rectangle = 4 cm

So, the area of a rectangle $= l \times b = (5 \times 4) \text{ cm}^2 = 20 \text{ cm}^2$

And the perimeter of a rectangle $= 2(l + b) = 2(5 + 4) = 18 \text{ cm}^2$

5. The area of rectangle $= 20 \text{ cm}^2$

Breadth = 4 cm

Length = ?

So, length of the rectangle $= (20 \div 4) \text{ cm} = 5 \text{ cm}$

6. Length of a plot of land = 35.5 m

Breadth of a plot of land = 17.5 m

So, the area of a plot of land $= l \times b$

$$= (35.5 \times 17.5)\ \text{m}^2 = 621.125\ \text{m}^2$$

$\because$ the cost of a plot of land per square metre = ₹ 220

$\therefore$ the cost of a plot of land 621.125 m^2 = ₹ 220×621.125

= ₹ 136675

7. The area of a rectangular field = 4800 m^2

length = 80 m

breadth = ?

So, the breadth of a rectangular field $= (4800 \div 80)$ m = 60 m

8. The area of a rectangle = 49 cm^2

Breadth = 28 mm = 2.8 cm

Length = ?

So, the length of a rectangle $= (49 \div 2.8)$ cm = 17.5 cm

9. Let the length of a rectangle be l unit.

Then, its breadth = b unit

So, the area of a rectangle $= l \times b\ \text{unit}^2 = A$

Now, according to the question

if $L = 2l \quad B = b$

So, the new area of a rectangle $= 2l \times b\ \text{unit}^2 = 2A$

Hence, the area of the new rectangle is 2 time the area of the actual rectangle.

10. Let the breadth of a rectangle be b.

Then, the length will be $2b$ of the rectangle.

So, the area of the rectangle $= l \times b = 2b \times b = 2b^2$

Hence, the area of the rectangle is 2 times the of breadth square or 2 $(\text{breadth})^2$.

11. Length of a park = 70 m 30 cm = 70.30 m

Breadth of a park = 30 m 40 cm = 30.40 m

So, area of a park $= l \times b = (70.30 \times 30.40)\ m^2 = 2137.12\ m^2$

$\because$ Cost of turfing the park per square metre = ₹ 10

$\therefore$ Cost of turfing the park 2137.12 m^2 = ₹ 2137.12×10

= ₹ 21371.20

12. The cost of flooring a rectangular area = ₹ 125

The cost of flooring a rectangular area per square metre = ₹ 2.50

So, the area of the floor $= \dfrac{\text{Total cost of flooring a rectangular area}}{\text{Cost of per square metre}}$

$$= \frac{125}{2.50} = 50\ m^2$$

13. Side of a square = 16 cm

So, area of a square $= (\text{side})^2 = (16)^2\ cm^2 = 256\ cm^2$
Length of a rectangle = 64 cm

So, area of rectangle $= l \times b = 64 \times b$

But the area of a square is the same area of a rectangle

So, $64 \times b = 256$

$b = (356 \div 64)$ cm

$b = 4$ cm

Hence, 4 cm is the breadth of the rectangle.

14. Let a be the side of a square.

Further, let A be the area of the square.

Then, $A = a^2$

Now, new side $= 2a$

New area $= (2a)^2 = 4a^2 = 4A$

Hence, the area of the new square is 4 times of the previous area.

15. The given,

The side of a square = 15.6 m

So, area of the square $= (\text{side})^2 = (15.6)\ m^2 = 243.36\ m^2$

$\because$ the cost of polishing the floor per m^2 = ₹ 30.50

$\therefore$ the cost of polishing the floor 243.36 m^2 = ₹ 30.50×243.36

= ₹ 7422.248

16. The area of a square = 169 cm^2

$\therefore$ the side of a square $= \sqrt{169} = \sqrt{13 \times 13} = 13$ cm

17. Side of a square = 12.5 m

So, area of a square $= (\text{side})^2 = (12.5)^2\ m^2 = 156.25\ m^2$

$\because$ The cost polishing the floor of a square hall per m^2 = ₹ 15

$\therefore$ The cost polishing the floor of a square hall 156.25 m^2

= ₹ 15×156.25 = ₹ 2343.375

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

Mental Maths :

1. Fill in the blanks :

(a) The area of a rectangle is **length × breadth.**

(b) The area of a square field is 324 m^2. Then the perimeter of the square is **72** cm.

(c) The length and breadth of a rectangle are in the ratio 2 : 1. If its breadth is 20 m, then its perimeter is **120 m.**

(d) The length of rectangle is thrice its breadth. The area of the rectangle is $\mathbf{3b^2}$.

2. Write T for 'True' or F for 'False' :

(a) T (b) F (c) F (d) T (e) T

Chapter 7

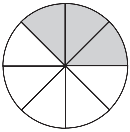
Fractions

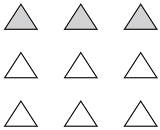
Exercise 7.1

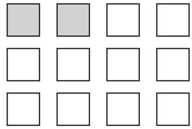
1. (a) $\frac{1}{2}$ (b) $\frac{1}{3}$ (c) $\frac{1}{3}$ (d) $\frac{2}{3}$

(e) $\frac{2}{5}$ (f) $\frac{2}{5}$ (g) $\frac{1}{2}$

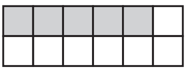
2. (a) $\frac{3}{8}$ (b) $\frac{3}{9}$ (c) $\frac{2}{12}$

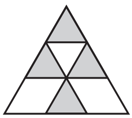


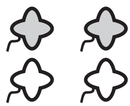




(d) $\frac{5}{12}$ (e) $\frac{4}{9}$ (f) $\frac{2}{4}$







3. $\because$ 1 day = 24 hours

6 hours $= \frac{6}{24} = \frac{1}{4}$

So, 6 hours are $\frac{1}{4}$ of a day.

4. $\because$ 1 kg = 1000 g

$\therefore$ 550 g $= \frac{550}{1000} = \frac{11}{20}$

So, 550 g are $\frac{11}{20}$ of a kg.

5. $\because$ 1 hour = 60 minutes

$\therefore$ 20 minutes $= \frac{20}{60}$ hour $= \frac{1}{3}$ hour

So, 20 minutes are $\frac{1}{3}$ of an hour.

6. Number of cricket matches = 6

Number of losted matches = 2

So, number of won matches = $(6-2) = 4$

So, the fraction of won matches $= \frac{4}{6} = \frac{2}{3}$

7. Total study time $= 10$ hours

Spend time on Mathematics $= 2$ hours

So, the fraction of his study devoted to Mathematics

$$= \frac{2}{10} \text{ hour} = \frac{1}{5} \text{ hour}$$

8. Radha had pens $= 50$

She gave pens to her friend $= 30$

So, the fraction of pen she gave to her friend $= \frac{30}{50} = \frac{3}{5}$

9. Number of white balls $= 10$

Number of black balls $= 15$

Number of red balls $= 10$

Total number of balls $= 10 + 15 + 10 = 35$

(a) The fraction of red balls to total number of balls $= \frac{10}{35} = \frac{2}{7}$

(b) The fraction of black balls to total number of balls $= \frac{15}{35} = \frac{3}{7}$

(c) The fraction of white balls to total number of balls $= \frac{10}{35} = \frac{2}{7}$

10. All natural numbers from 20 to 35 = 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35.

(a) The fraction of prime number to all natural numbers from 20 to 35 $= \frac{3}{16}$

(b) The fraction of even number to all natural numbers from 30 to 35 $= \frac{8}{16} = \frac{1}{2}$

(c) The fraction of composite numbers to all natural numbers from 20 to 35 $= \frac{13}{16}$

11. Total number of students $= 45$

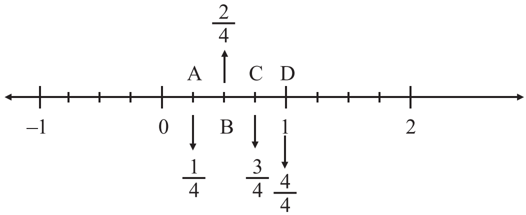
Number of students who like Mathematics $= 15$

Number of students who don't like Mathematics $= (45 - 15) = 30$

So, the fraction of students who don't like Mathematics to total number of students $= \frac{30}{45} = \frac{2}{3}$

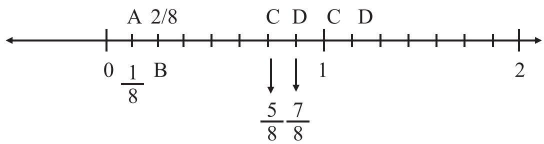
Exercise 7.2

1. (a)

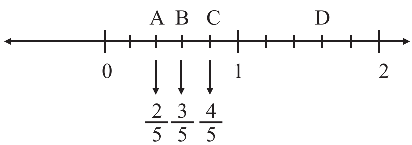


A, B, C and D are represent $\frac{1}{4}, \frac{2}{4}, \frac{3}{4}$ and $\frac{4}{4}$.

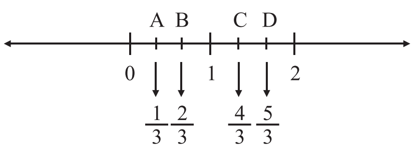
(b) A, B, C and D are represent $\frac{1}{8}, \frac{2}{8}, \frac{5}{8}$ and $\frac{7}{8}$.



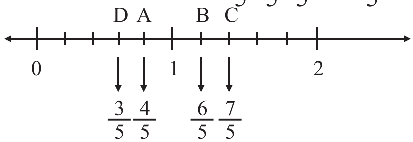
(c) A, B, C and D are represent $\frac{2}{5}, \frac{3}{5}, \frac{4}{5}$ and $\frac{8}{5}$.



(d) A, B, C and D are represent $\frac{1}{3}, \frac{2}{3}, \frac{4}{3}$ and $\frac{5}{3}$.



(e) A, B, C and D are represent $\frac{4}{5}, \frac{6}{5}, \frac{7}{5}$ and $\frac{3}{5}$.



2. (a) $\frac{20}{3} = 6\frac{2}{3}$ (b) $\frac{15}{4} = 3\frac{3}{4}$ (c) $\frac{17}{5} = 3\frac{2}{5}$

(d) $\frac{23}{5} = 4\frac{3}{5}$ (e) $\frac{75}{6} = 12\frac{3}{6}$ (f) $\frac{29}{4} = 7\frac{1}{4}$

3. (a) $4\frac{5}{6} = \frac{4 \times 6 + 5}{6} = \frac{24 + 5}{6} = \frac{29}{6}$

(b) $6\frac{1}{7} = \frac{6 \times 7 + 1}{7} = \frac{42 + 1}{7} = \frac{43}{7}$

(c) $10\frac{3}{5} = \frac{10 \times 5 + 3}{5} = \frac{50 + 3}{5} = \frac{53}{5}$

(d) $14\frac{1}{7} = \frac{14 \times 7 + 1}{7} = \frac{98 + 1}{7} = \frac{99}{7}$

(e) $16\frac{2}{3} = \frac{16 \times 3 + 2}{3} = \frac{48 + 2}{3} = \frac{50}{3}$

(f) $19\frac{4}{5} = \frac{19 \times 5 + 4}{5} = \frac{95 + 4}{5} = \frac{99}{5}$

4. (a) $\frac{2}{5} = \frac{\square}{50}$

The given denominators are 50 and 5 and $30 \div 5 = 10$.

So, $\frac{2 \times 10}{5 \times 10} = \frac{\square}{50}$

(b) $\frac{4}{7} = \frac{12}{\square}$

The given numerator are 12 and 4 and $12 \div 4 = 3$.

So, $\frac{4 \times 3}{7 \times 3} = \frac{12}{21}$

(c) $\frac{6}{9} = \frac{2}{\square}$

The given numerator are 6 and 2 and $6 \div 2 = 3$.

So, $\frac{6 \div 3}{9 \div 3} = \frac{2}{\boxed{3}}$

(d) $\frac{16}{14} = \frac{32}{\square}$

The given numerator are 16 and 32 and $32 \div 16 = 2$.

So, $\frac{16 \times 2}{14 \times 2} = \frac{32}{\boxed{28}}$

(e) $\frac{15}{70} = \frac{3}{\square}$

The given numerator are 15 and 3 and $15 \div 3 = 5$.

So, $\frac{15 \div 5}{70 \div 5} = \frac{3}{\boxed{14}}$

(f) $\frac{45}{\square} = \frac{15}{4}$

The given numerator are 45 and 15 and $45 \div 15 = 3$.

So, $\frac{15 \times 3}{4 \times 3} = \frac{45}{\boxed{12}}$

(g) $\frac{8}{14} = \frac{40}{\square}$

The given numerator are 8 and 40 and $40 \div 8 = 5$

So, $\frac{8 \times 5}{14 \times 5} = \frac{40}{\boxed{70}}$

(h) $\frac{3}{11} = \frac{\square}{55}$

The given denominator are 55 and 11 and $55 \div 11 = 5$

So, $\frac{3 \times 5}{11 \times 5} = \frac{\boxed{15}}{55}$

5. (a) Equivalent fraction of $\frac{3}{4}$ with denominator 16 can be obtained by multiplying its numerator and denominator by 4.

$$\frac{3 \times 4}{4 \times 4} = \frac{12}{16}$$

So, fraction $\frac{12}{16}$ is equivalent of $\frac{3}{4}$.

(b) Equivalent fraction of $\frac{5}{7}$ with numerator 35 can be obtained by multiplying it numerator and denominator by 7.

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

So, fraction $\frac{35}{49}$ is equivalent of $\frac{5}{7}$.

(c) Equivalent fraction of $\frac{25}{45}$ with denominator 9 can be obtained by dividing its numerator and denominator by 5.

$$\frac{25 \div 5}{45 \div 5} = \frac{5}{9}$$

So, fraction $\frac{25}{45}$ is equivalent of $\frac{5}{9}$.

(d) Equivalent fraction of $\frac{15}{75}$ with numerator 3 can be obtained by dividing its numerator and denominator by 5.

$$\frac{15 \div 5}{75 \div 5} = \frac{3}{15}$$

So, fraction $\frac{15}{75}$ is equivalent of $\frac{3}{15}$.

(e) Equivalent fraction of $\frac{20}{150}$ with denominator 75 can be obtained by dividing its numerator and denominator by 2.

$$\frac{20 \div 2}{150 \div 2} = \frac{10}{75}$$

So, fraction $\frac{20}{150}$ is equivalent $\frac{10}{75}$.

(f) Equivalent fraction of $\frac{4}{8}$ with numerator can be obtained by multiplying its numerator and denominator by 2.

$$\frac{4 \times 2}{8 \times 2} = \frac{8}{16}$$

So, fraction $\frac{8}{16}$ is equivalent of $\frac{4}{8}$.

(g) Equivalent fraction of $\frac{7}{5}$ with denominator 30 can be obtained by multiplying its numerator and denominator by 6.

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

So, fraction $\frac{7}{5}$ is equivalent of $\frac{42}{30}$.

(h) Equivalent fraction of $\frac{1}{2}$ with denominator 8 can be obtained by multiplying its numerator and denominator by 4.

$$\frac{1 \times 4}{2 \times 4} = \frac{4}{8}$$

So, fraction $\frac{1}{2}$ is equivalent of $\frac{4}{8}$.

6. By cross multiplication method :

(a) $\frac{2}{3}, \frac{5}{9}$

$2 \times 9 = 18$ and $3 \times 5 = 15$

Since, $2 \times 9 \neq 3 \times 5$

Therefore, $\frac{2}{3} \neq \frac{5}{9}$

So, $\frac{2}{3}$ and $\frac{5}{9}$ are not equivalent.

(b) $\frac{3}{8}, \frac{9}{24}$

$3 \times 24 = 72$ and $8 \times 9 = 72$

Since, $3 \times 24 = 8 \times 9$

Therefore, $\frac{3}{8} = \frac{9}{24}$

So, $\frac{3}{8}$ and $\frac{9}{24}$ are equivalent.

(c) $\frac{5}{25}, \frac{1}{5}$

$5 \times 5 = 25$ and $25 \times 1 = 25$

Since, $5 \times 5 = 25 \times 1$

Therefore, $\frac{5}{25} = \frac{1}{5}$

So, $\frac{5}{25}$ and $\frac{1}{5}$ are equivalent.

(d) $\frac{15}{20}, \frac{2}{3}$

$15 \times 3 = 45$ and $20 \times 2 = 60$

Since, $15 \times 3 \neq 20 \times 2$

Therefore, $\frac{15}{20} \neq \frac{2}{3}$

So, $\frac{15}{20}$ and $\frac{2}{3}$ are not equivalent.

(e) $\frac{7}{13}, \frac{5}{11}$

$7 \times 11 = 77$ and $13 \times 5 = 65$

Since, $7 \times 11 \neq 13 \times 5$

Therefore, $\frac{7}{13} \neq \frac{5}{11}$

So, $\frac{7}{13}$ and $\frac{5}{11}$ are not equivalent.

(f) $\frac{4}{7}, \frac{8}{14}$

$4 \times 14 = 56$ and $7 \times 8 = 56$

Since, $4 \times 14 = 7 \times 8$

Therefore, $\frac{4}{7} = \frac{8}{14}$

So, $\frac{4}{7}$ and $\frac{8}{14}$ are equivalent.

(g) $\frac{11}{66}, \frac{2}{12}$

$11 \times 12 = 132$ and $66 \times 2 = 132$

Since $11 \times 12 = 66 \times 2$

Therefore, $\frac{11}{66} = \frac{2}{12}$

So, $\frac{11}{66}$ and $\frac{2}{12}$ are equivalent.

(h) $\frac{25}{32}, \frac{32}{25}$

$25 \times 25 = 625$ and

$32 \times 32 = 1024$

Since $25 \times 25 \neq 32 \times 32$

Therefore, $\frac{25}{32} \neq \frac{32}{25}$

So, $\frac{25}{32}$ and $\frac{32}{25}$ are equivalent.

7. To reduce fraction in its lowest form we find HCF of numerator and denominator.

(a) $\because$ HCF of 150 and 250 is 50.

$$\therefore \frac{250}{150} = \frac{250 \div 50}{150 \div 50} = \frac{5}{3}$$

Hence, $\frac{5}{3}$ is the simplest form of $\frac{250}{150}$.

150)250(1
−150
100)150(1
−100
50)100(2
− 100
×

(b) $\because$ HCF of 95 and 75 is 5.

$$\therefore \frac{95}{75} = \frac{95 \div 5}{75 \div 5} = \frac{19}{15}$$

Hence, $\frac{19}{15}$ is the simplest form of $\frac{95}{75}$.

75)95(1
−75
20)75(3
60
15)20(2
− 15
5)15(3
15
×

(c) $\because$ HCF of 42 and 68 is 2.

$$\therefore \frac{42}{68} = \frac{42 \div 2}{68 \div 2} = \frac{21}{34}$$

Hence, $\frac{21}{34}$ is the simplest form of $\frac{42}{68}$.

42)68(1
42
26)42(2
26
16)26(1
16
10)16(1
10
6)10(1
6
4)6(1
4
2)4(2
4
×

(d) $\because$ HCF of 23 and 46 is 23.

$$\therefore \frac{23}{46} = \frac{23 \div 23}{46 \div 23} = \frac{1}{2}$$

Hence, $\frac{1}{2}$ is the simplest form of $\frac{23}{46}$.

23)46(2
46
×

(e) ∵ HCF of 12 and 54 is 6.

12)54(4
–48
6)12(2
–12
×

$\therefore \frac{12}{54} = \frac{12 \div 6}{54 \div 6} = \frac{2}{9}$

Hence, $\frac{2}{9}$ is the simplest form of $\frac{12}{54}$.

(f) ∵ HCF of 68 and 72 is 4.

68)72(1
–68
4)68(17
–68
×

$\therefore \frac{68}{72} = \frac{68 \div 4}{72 \div 4} = \frac{17}{18}$

Hence, $\frac{17}{18}$ is the simplest form of $\frac{68}{72}$.

36)63(1
–36
27)36(1
27
9)27(3
27
×

(g) ∵ HCF of 36 and 63 is 9.

$\therefore \frac{36}{63} = \frac{36 \div 9}{63 \div 9} = \frac{4}{7}$

Hence, $\frac{4}{7}$ is the simplest form of $\frac{36}{63}$.

(h) ∵ HCF of 17 and 51 is 17.

17)51(3
–57
×

$\therefore \frac{17}{51} = \frac{17 \div 17}{51 \div 17} = \frac{1}{3}$

Hence, $\frac{1}{3}$ is the simplest form of $\frac{17}{51}$.

46)76(1
–46
30)46(1
–30
16)30(1
–16
14)16(1
–14
2)14(2
–14
×

(i) ∵ HCF of 46 and 76 is 2.

$\therefore \frac{46}{76} = \frac{46 \div 2}{76 \div 2} = \frac{23}{38}$

Hence, $\frac{23}{38}$ is the simplest form of $\frac{46}{76}$.

8. Sakshi had pencils = 50

Sakshi used pencils = 25

So, the fraction $= \frac{25}{50} = \frac{1}{2}$

Aanchal had pencils = 90

Aanchal used pencils = 45

So, the fraction $\frac{45}{90} = \frac{1}{2}$

Chanchal had pencils = 48

Chanchal used pencils = 24

So, the fraction $= \frac{24}{48} = \frac{1}{2}$

Yes, they used equal fraction of pencils.

9. Equivalent fraction of $\frac{7}{12}, \frac{3}{8}, \frac{1}{4}$ and $\frac{60}{72}$ with denominator 144 can be obtained by multiplying its numerator and denominator by 12, 18, 36 and 2 respectively.

So, $\frac{7 \times 12}{12 \times 12}, \frac{3 \times 18}{8 \times 18}, \frac{1 \times 36}{4 \times 36}$ and $\frac{60 \times 2}{72 \times 2}$

or $\frac{84}{144}, \frac{54}{144}, \frac{36}{144}$ and $\frac{120}{144}$

Ascending order are $\frac{36}{144}, \frac{54}{144}, \frac{84}{144}$ and $\frac{120}{144}$.

or $\frac{1}{4} < \frac{3}{8} < \frac{7}{12} < \frac{60}{72}$.

Exercise 7.3

1. (a) $\frac{11}{24} \square \frac{9}{24}$

By cross multiplication, we see that

$\frac{11}{24} \times \frac{9}{24} \Rightarrow 24 \times 9$ and 11×24

or 216 and 264

Since, $264 > 216$

So, $\frac{11}{24} \boxed{>} \frac{9}{24}$

(b) $\frac{3}{7} \square \frac{5}{3}$

By cross multiplication, we see that

$\frac{3}{7} \times \frac{5}{3} \Rightarrow 3 \times 3$ and 7×5

or 9 and 35

Since, $9 < 35$

So, $\frac{3}{7} \boxed{<} \frac{5}{3}$

(c) $\frac{7}{15} \square \frac{3}{5}$

By cross multiplication, we see that

$\frac{7}{15} \times \frac{3}{5} \Rightarrow 7 \times 5$ and 15×3

or 35 and 45

Since, $35 < 45$

So, $\frac{7}{15} \boxed{<} \frac{3}{5}$

(d) $\frac{4}{9} \square \frac{24}{54}$

By cross multiplication, we see that

$\frac{4}{9} \times \frac{24}{54} \Rightarrow 4 \times 54$ and 9×24

or 216 and 216

Since, $216 = 216$

So, $\frac{4}{9} \boxed{=} \frac{24}{54}$

(e) $2\frac{1}{2}$ $\square$ $2\frac{1}{4}$

By cross multiplication,

we see that

$\frac{5}{2} \times \frac{9}{4} \Rightarrow 5 \times 4$ and 2×9

or 20 and 18

Since, $20 > 18$

So, $2\frac{1}{2} \boxed{>} 2\frac{1}{4}$

(f) $1\frac{1}{4}$ $\square$ 5

By cross multiplication,

we see that

$\frac{5}{4} \times \frac{5}{1} \Rightarrow 5 \times 1$ and 4×5

or 5 and 20

Since, $5 < 20$

So, $1\frac{1}{4} \boxed{<} 5$

(g) $\frac{3}{5} \square \frac{30}{50}$

By cross multiplication,

we see that

$\frac{3}{5} \times \frac{30}{50} \Rightarrow 3 \times 50$

and 30×5

or 150 and 150

Since, $150 = 150$

So, $\frac{3}{5} \boxed{=} \frac{30}{50}$

(h) $\frac{7}{5} \square \frac{4}{7}$

By cross multiplication,

we see that

$\frac{7}{5} \times \frac{4}{7} \Rightarrow 7 \times 7$

and 5×4

or 49 and 20

Since, $49 > 20$

So, $\frac{7}{5} \boxed{>} \frac{4}{7}$

(i) $\frac{4}{3} \square \frac{5}{4}$

By cross multiplication,

we see that

$\frac{4}{3} \times \frac{5}{4} \Rightarrow 4 \times 4$

and 3×5

or 16 and 15

Since, $16 > 15$

So, $\frac{4}{3} \boxed{>} \frac{5}{4}$

(j) $\frac{9}{4} \square \frac{18}{8}$

By cross multiplication,

we see that

$\frac{9}{4} \times \frac{18}{8} \Rightarrow 9 \times 8$

and 4×18

or 72 and 72

Since, $72 = 72$

So, $\frac{9}{4} \boxed{=} \frac{18}{8}$

2. (a) $\frac{1}{6}, \frac{4}{6}, \frac{11}{6}, \frac{7}{6}$ and $\frac{5}{6}$

Denominator of given fractions are already same.

Clearly, $\frac{11}{6} > \frac{7}{6} > \frac{5}{6} > \frac{4}{6} > \frac{1}{6}$

Hence, the given fractions in the descending order are $\frac{11}{6}, \frac{7}{6}, \frac{5}{6}, \frac{4}{6}$, and $\frac{1}{6}$.

(b) $\frac{1}{12}, \frac{4}{12}, \frac{3}{12}, \frac{7}{12}$ and $\frac{9}{12}$

Denominator of given fractions are already same.

Clearly, $\frac{9}{12} > \frac{7}{12} > \frac{4}{12} > \frac{3}{12} > \frac{1}{12}$

Hence, the given fractions in the descending order are $\frac{9}{12}, \frac{7}{12}, \frac{4}{12}, \frac{3}{12}$ and $\frac{1}{12}$.

(c) $\frac{4}{6}, \frac{4}{3}, \frac{4}{2}, \frac{4}{7}$ and $\frac{4}{9}$.

Since, the numerator of the given fractions are same them the fraction with smaller denominator is greater than the fraction with greater denominator.

So, $\frac{4}{2} > \frac{4}{3} > \frac{4}{6} > \frac{4}{7} > \frac{4}{9}$

Hence, the given fractions in the descending order are $\frac{4}{2}, \frac{4}{3}, \frac{4}{6}, \frac{4}{7}$ and $\frac{4}{9}$.

(d) $\frac{1}{2}, \frac{3}{2}, \frac{4}{5}$ and $\frac{5}{4}$

Denominator of the fractions are 2, 2, 5 and 4.

So, we converrt each one of the given fraction into an equivalent fmaction with denominator 20.

2	2, 2, 5, 4
2	1, 1, 5, 2
5	1, 1, 5, 1
	1, 1, 1, 1

$\text{LCM} = 2 \times 2 \times 50 = 20$

$\frac{1}{2} = \frac{1 \times 10}{2 \times 10} = \frac{10}{20}; \frac{3}{2} = \frac{3 \times 10}{2 \times 10} = \frac{30}{20};$

$\frac{4}{5} = \frac{4 \times 4}{5 \times 4} = \frac{16}{20}$ and $\frac{5}{4} = \frac{5 \times 5}{4 \times 5} = \frac{25}{20}$

Clearly, $\frac{30}{20} > \frac{25}{20} > \frac{16}{20} > \frac{10}{20}$

$\therefore \quad \frac{3}{2} > \frac{5}{4} > \frac{4}{5} > \frac{1}{2}$

Hence, the given fraction in the decreasing order are $\frac{3}{2}, \frac{5}{4}, \frac{4}{5}$ and $\frac{1}{2}$.

3. (a) $\frac{3}{5}, \frac{13}{7}$

LCM of (5, 7) = 35

So, $\frac{3 \times 7}{5 \times 7} = \frac{21}{35}$ and $\frac{13}{7} = \frac{13 \times 5}{7 \times 5} = \frac{65}{35}$

Hence, the equivalent like fractions are $\frac{21}{35}$ and $\frac{65}{35}$.

(b) $\frac{17}{21}, \frac{19}{7}$

LCM of (21, 7) = 21

So, $\frac{17}{21} = \frac{17 \times 1}{21 \times 1} = \frac{17}{21}$ and $\frac{19}{7} = \frac{19 \times 3}{7 \times 3} = \frac{57}{21}$

Hence, the equivalent like fraction are $\frac{17}{21}$ and $\frac{57}{21}$.

(c) $\frac{7}{10}$ and $\frac{8}{15}$

LCM of (10, 15) = 60

So, $\frac{7}{10} = \frac{7 \times 6}{10 \times 6} = \frac{42}{60}$ and $\frac{8}{15} = \frac{8 \times 4}{15 \times 4} = \frac{32}{60}$

Hence, the equivalent like fractions are $\frac{42}{60}$ and $\frac{32}{60}$.

(d) $\frac{2}{3}, \frac{3}{4}$

LCM of (3, 4) = 12

So, $\frac{2}{3} = \frac{2 \times 4}{3 \times 4} = \frac{8}{12}$ and $\frac{3}{4} = \frac{3 \times 3}{4 \times 3} = \frac{9}{12}$

Hence, the equivalent like fractions are $\frac{8}{12}$ and $\frac{9}{12}$.

(e) $\frac{3}{5}, \frac{4}{7}$

LCM of (5, 7) = 35

So, $\frac{3}{5} = \frac{3 \times 7}{5 \times 7} = \frac{21}{35}$ and $\frac{4}{7} = \frac{4 \times 5}{7 \times 5} = \frac{20}{35}$

Hence, the equivalent like fractions are $\frac{21}{35}$ and $\frac{20}{35}$.

(f) $\frac{2}{5}, \frac{1}{4}$

LCM of (5, 4) = 20

So, $\frac{2}{5} = \frac{2 \times 4}{5 \times 4} = \frac{8}{20}$ and $\frac{1}{4} = \frac{1 \times 4}{4 \times 4} = \frac{4}{16}$

Hence, the equivalent like fractions are $\frac{8}{20}$ and $\frac{4}{16}$.

(g) $1\frac{1}{2}, 4\frac{1}{5}$ or $\frac{3}{2}, \frac{21}{5}$

LCM of (2, 5) = 10

So, $\frac{3}{2} = \frac{3 \times 5}{2 \times 5} = \frac{15}{10}$ and $\frac{21}{5} = \frac{21 \times 2}{5 \times 2} = \frac{42}{10}$

Hence, the equivalent like fractions are $\frac{15}{10}$ and $\frac{21}{5}$.

(h) $2\frac{1}{4}, 3\frac{1}{5}$ or $\frac{9}{4}, \frac{16}{5}$

LCM of (4, 5) = 20

So, $\frac{9}{4} = \frac{9 \times 5}{4 \times 5} = \frac{45}{20}$ and $\frac{16}{5} = \frac{16 \times 4}{5 \times 4} = \frac{64}{20}$

Hence, the equivalent like fractions are $\frac{45}{20}$ and $\frac{64}{20}$.

4. Let us find the fraction of the book read by Pradeep

$$= \frac{2}{7} \times 280 = 2 \times 40 = 80 \text{ pages}$$

Nitin read of the book = 120 pages

Since, $80 < 120$

So, Nitin read more.

5. Compare $2\frac{1}{4}$ and $2\frac{2}{5}$.

We see that the denominator are different so, we find their LCM.

LCM of (4, 5) = 20

$\frac{9}{4} = \frac{9 \times 5}{4 \times 5} = \frac{45}{20}$ and $\frac{12}{5} = \frac{12 \times 4}{5 \times 4} = \frac{48}{20}$

Since, $\frac{45}{20} < \frac{48}{20}$

So, Sagar took more time for completing the homework.

6. Ms. Komal bought apples $= 15\frac{1}{4}$ kg $= \frac{61}{4}$ kg

Ms Leena bought apples $= 15\frac{2}{3}$ kg $= \frac{47}{3}$ kg

Now, let us compare $\frac{61}{4}$ and $\frac{47}{3}$.

LCM of (4, 3) = 12

$$\frac{61}{4} = \frac{61 \times 3}{4 \times 3} = \frac{183}{12}$$

$$\frac{47}{3} = \frac{47 \times 4}{3 \times 4} = \frac{188}{12}$$

Since, $\frac{183}{12} < \frac{188}{12}$ or $\frac{61}{4} < \frac{47}{3}$

Hence, Ms Komal bought less amount of apples.

7. Let us find the fraction of school $A = \frac{250}{650} = \frac{5}{13}$

Similarly, the fraction of school $B = \frac{300}{750} = \frac{2}{5}$

Now, let us compare $\frac{5}{13}$ and $\frac{2}{5}$.

LCM of (13, 5) = 65

$$\frac{5}{13} = \frac{5 \times 5}{13 \times 5} = \frac{25}{65}$$

$$\frac{2}{5} = \frac{2 \times 13}{5 \times 13} = \frac{26}{65}$$

Since, $\frac{25}{65} < \frac{26}{65}$ or $\frac{5}{13} < \frac{2}{5}$

School B are selected more students.

Exercise 7.4

1. (a) $\frac{1}{5} + \frac{3}{5} = \frac{1+3}{5} = \frac{4}{5}$

(b) $\frac{1}{6} + \frac{2}{6} = \frac{1+2}{6} = \frac{3}{6} = \frac{1}{2}$

(c) $\frac{6}{17} + \frac{3}{17} + \frac{4}{17} = \frac{6+3+4}{17} = \frac{13}{17}$

(d) $\frac{1}{40} + \frac{13}{40} + \frac{23}{40} = \frac{1+13+23}{40} = \frac{37}{40}$

2. (a) $\frac{5}{2} + \frac{7}{3} = \frac{5 \times 3 + 7 \times 2}{6} = \frac{15+4}{6} = \frac{29}{6} = 4\frac{5}{6}$

(b) $4\frac{1}{6} + \frac{2}{3} = \frac{25}{6} + \frac{2}{3} = \frac{25+4}{6} = \frac{29}{6} = 4\frac{5}{6}$

(c) $3\frac{1}{3} + 4\frac{3}{5} = \frac{10}{3} + \frac{23}{5} = \frac{10 \times 5 + 23 \times 3}{15} = \frac{50+69}{15} = \frac{119}{15} = 7\frac{14}{15}$

(d) $\frac{51}{8} + \frac{16}{6} = \frac{51 \times 3 + 16 \times 4}{24} = \frac{153+64}{24} = \frac{217}{24} = 9\frac{1}{24}$

(e) $\frac{5}{8} + \frac{1}{4} = \frac{5+2}{8} = \frac{7}{8}$

(f) $\frac{8}{24} + \frac{3}{8} = \frac{8+9}{24} = \frac{17}{24}$

(g) $3+\frac{2}{11}=\frac{3\times 11+2}{11}=\frac{33+2}{11}=\frac{35}{11}=3\frac{2}{11}$

(h) $5+1\frac{1}{4}=5+\frac{5}{4}=\frac{5\times 4+5}{4}=\frac{20+5}{4}=\frac{25}{4}$

(i) $\frac{1}{2}+\frac{3}{4}+1\frac{1}{3}=\frac{1}{2}+\frac{3}{4}+\frac{4}{3}=\frac{6+9+16}{12}=\frac{31}{12}=2\frac{7}{12}$

(j) $6\frac{3}{4}+2\frac{1}{5}=\frac{27\times 5+11\times 4}{20}=\frac{135+44}{20}=\frac{179}{20}=8\frac{19}{20}$

(k) $\frac{4}{9}+\frac{2}{15}+\frac{3}{5}=\frac{4\times 5+2\times 3+9\times 3}{45}=\frac{20+6+27}{45}=\frac{53}{45}=1\frac{8}{45}$

(l) $2+\frac{1}{13}+1\frac{1}{13}=2+\frac{1}{13}+\frac{14}{13}$

$=\frac{2\times 13+1+14}{13}=\frac{26+1+14}{13}=\frac{41}{13}=3\frac{2}{13}$

3. (a) $6-\frac{3}{4}=\frac{6\times 4-3}{4}=\frac{24-3}{4}=\frac{21}{4}=5\frac{1}{4}$

(b) $8-2\frac{1}{4}=8-\frac{9}{4}=\frac{8\times 4-9}{4}=\frac{32-9}{4}=\frac{23}{4}=5\frac{3}{4}$

(c) $2\frac{3}{8}-1\frac{3}{16}=\frac{19}{8}-\frac{19}{16}=\frac{19\times 2-19}{16}=\frac{38-19}{16}=\frac{19}{16}=1\frac{3}{16}$

(d) $\frac{8}{24}-\frac{3}{18}=\frac{8\times 3-3\times 4}{72}=\frac{24-12}{72}=\frac{12}{72}=\frac{1}{6}$

(e) $\frac{7}{12}-\frac{1}{6}=\frac{7-2}{12}=\frac{5}{12}$

(f) $\frac{8}{15}-\frac{3}{20}=\frac{32-9}{60}=\frac{23}{60}$

(g) $6\frac{3}{4}-2\frac{1}{5}=\frac{27}{4}-\frac{11}{5}=\frac{27\times 5-11\times 4}{20}=\frac{135-44}{20}=\frac{91}{20}=4\frac{11}{20}$

(h) $14-5\frac{1}{2}=14-\frac{11}{2}=\frac{14\times 2-11}{2}=\frac{28-11}{2}=\frac{17}{2}=8\frac{1}{2}$

(i) $\frac{7}{12}-\frac{4}{15}=\frac{7\times 5-4\times 4}{60}=\frac{35-16}{60}=\frac{19}{60}$

(j) $\frac{5}{8}-\frac{1}{4}=\frac{5-2}{8}=\frac{3}{8}$

(k) $3 - 1\frac{1}{2} = 3 - \frac{3}{2} = \frac{6-3}{2} = \frac{3}{2} = 1\frac{1}{2}$

(l) $\frac{4}{5} - \frac{3}{7} = \frac{4 \times 7 - 3 \times 5}{35} = \frac{28-15}{35} = \frac{13}{35}$

4. The length of two ribbons are $5\frac{1}{3}$ m and $6\frac{1}{5}$ m.

So, the total length of ribbons $= \left(5\frac{1}{3} + 6\frac{1}{5}\right)$ m $= \left(\frac{16}{3} + \frac{31}{5}\right)$ m

$= \left(\frac{80+93}{15}\right)$ m $= \frac{173}{15}$ m $= 11\frac{8}{15}$ m

Hence, the total length of ribbon is $11\frac{8}{15}$ m.

5. Mr. Sharma purchased vegetable oil = 20 litres

He gave oil to his son $= 5\frac{3}{4}$ litres $= \frac{23}{4}$ litres

He gave oil to his daughter $= 6\frac{1}{5}$ litre $= \frac{31}{5}$ litres

He gave total oil $= \left(\frac{23}{4} + \frac{31}{5}\right)$ litres $= \left(\frac{115+124}{20}\right)$ litres $= \frac{239}{20}$ litres

So, the oil left with him $= \left(20 - \frac{239}{20}\right)$ litres

$= \left(\frac{400-239}{20}\right)$ litres

$= \frac{161}{20}$ litres $= 8\frac{1}{20}$ litres

6. Rohan purchased books = ₹ $65\frac{3}{4}$

He gave amount to the shopkeeper = ₹ 100

The amount returned by the shopkeeper

= ₹ $\left(100 - 65\frac{3}{4}\right)$ = ₹ $\left(100 - \frac{263}{4}\right)$

= ₹ $\frac{(400-263)}{4}$ = ₹ $\frac{137}{4}$ = ₹ $34\frac{1}{4}$

7. Arpit bought apples $= 6\frac{1}{3}$ kg $= \frac{19}{3}$ kg

Arpit bought oranges $= 5\frac{1}{7}$ kg $= \frac{36}{7}$ kg

So, the total weight of fruits bought by him $= \left(\frac{19}{3} + \frac{36}{7}\right)$ kg

$= \left(\frac{133 + 108}{21}\right)$ kg $= \frac{241}{21}$ kg $= 11\frac{10}{21}$ kg

8. Milk left in the other vessel $= \left(5\frac{1}{6} - 3\frac{1}{4}\right)$ litres

$= \left(\frac{31}{6} - \frac{13}{4}\right)$ litres $= \left(\frac{62 - 39}{12}\right)$ litres

$= \frac{23}{12}$ litres $= 1\frac{11}{12}$ litres

9. Mrs Kapoor travelled by car $= 20\frac{2}{5}$ km $= \frac{102}{5}$ km

Mrs Kapoor travelled by bus $= 10\frac{1}{4}$ km $= \frac{41}{4}$ km

So, the total distance covered by her $= \left(\frac{102}{5} + \frac{41}{4}\right)$ km

$= \left(\frac{408 + 205}{20}\right)$ km $= \frac{613}{20}$ km $= 30\frac{13}{20}$ km

10. A recipe needs milk $= 2\frac{3}{4}$ cup $= \frac{11}{4}$ cup

A recipe needs cream $= 1\frac{2}{3}$ cup $= \frac{5}{3}$ cup

Compare the quantity $\frac{11}{4}$ and $\frac{5}{3}$.

LCM of (4, 3) = 12

$$\frac{11}{4} = \frac{11 \times 3}{4 \times 3} = \frac{33}{12} \text{ and } \frac{5}{3} = \frac{5 \times 4}{3 \times 4} = \frac{20}{12}$$

Since, $\frac{33}{12} > \frac{20}{12}$

And their difference $= \frac{33 - 20}{12} = \frac{13}{12} = 1\frac{1}{12}$

Hence, milk is required in more quantity and by $1\frac{1}{12}$ cup.

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

Mental Maths :

1. Fractions having the same denominators are called **like** fractions.
2. When the numerator of a fraction is greater than the denominator, then the fraction is said to be an **improper fraction.**
3. The simplest form of $\frac{10}{4}$ is $\mathbf{\frac{5}{2}}$.
4. $\frac{2}{3}$ is **less** than $\frac{3}{2}$.
5. In a fraction $\frac{8}{11}$, 8 is the **numerator** of the fraction.

HOTS

1. Dipika purchased juice = 30 litres

She gave juice to her friend Shivani = $7\frac{2}{3}$ litres

She gave juice to her brother = $5\frac{2}{5}$ litres

So, juice left with her $= \left[30 - \left\{7\frac{2}{3} + 5\frac{2}{5}\right\}\right]$ litres

$$= \left(\frac{30}{1} - \frac{23}{3} - \frac{27}{5}\right) \text{ litres}$$

$$= \left(\frac{450 - 115 - 81}{15}\right) \text{ litres}$$

$$= \left(\frac{450 - 196}{15}\right) \text{ litres}$$

$$= \frac{254}{15} \text{ litres} = 16\frac{14}{15} \text{ litres}$$

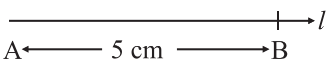
2. He has seconds $= \frac{2}{5} \text{ of } \frac{1}{2} \text{ of } \frac{2}{3} = \frac{2}{5} \times \frac{1}{2} \times \frac{2}{3} \times 60 = 4 \times 2 = 8 \text{ seconds}$

Chapter

8 Playing with Constructions

Exercise 8.1

1. (a) Steps of Construction :



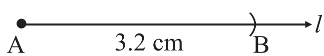
Step-1. Draw a line *l* and mark a point *A* on line.

Step-2. Take compasses and place its pointer end at the zero and open its pencil end to place it marked at a point 5 cm on the ruler.

Step-3. Without disturbing the opening of the compases, place its needle at point *A* and draw an arc to cut the line *l* at point *B*.

Step-4. *AB* is the required line segment of length 5 cm.

(b) Steps of Construction :



Step-1. Draw a line *l* and mark a point *A* on line.

Step-2. Take compasses and place its pointer end at the zero and open its pencil end to place it marked at a point 3.2 cm on the ruler.

Step-3. Without disturbing the opening of the compases, place its needle at point *A* and draw an arc to cut the line *l* at point *B*.

Step-4. *AB* is the required line segment of length 3.2 cm.

(c) Steps of Construction :

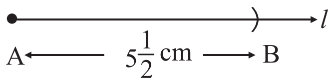
Step-1. Draw a line *l* and mark a point *A* on line.

Step-2. Take compasses and place its pointer end at the zero and open its pencil end to place it marked at a point 7.7 cm on the ruler.

Step-3. Without disturbing the opening of the compases, place its needle at point *A* and draw an arc to cut the line *l* at point *B*.

Step-4. *AB* is the required line segment of length 7.7 cm.

(d) Steps of construction :



Step-1. Draw a line *l* and mark a point *A* on line.

Step-2. Take compasses and place its pointer end at the zero and open its pencil end to place it marked at a point $5\frac{1}{2}$ cm on the ruler.

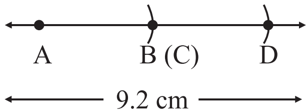
Step-3. Without disturbing the opening of the compases, place its needle at point *A* and draw an arc to cut the line *l* at point *B*.

Step-4. *AB* is the required line segment of length $5\frac{1}{2}$ cm.

2. (a) Steps of construction : Two line segment $\overline{AB}$ and $\overline{CD}$.

Step-1. Construct a line segment, say *AD*, such that $\overline{AD} = \overline{AB} + \overline{CD}$.

Step-2. Draw a line *l* and mark point *A* on it.



Step-3. Take the compasses and measure $\overline{AB}$.

Step-4. Without disturbing the opening, place its needle at A and draw an arc cutting line l and B.

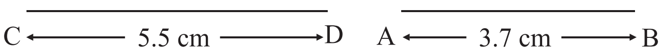
Step-5. Again adjust the compasses and measure the line segment CD.

Step-6. Without disturbing the opening, place the pointer at point C on the line l and draw an arc cutting the line l at D.

Step-7. $\overline{AD}$ is the required line segment whose length is equal to the sum of the lengths of line segmens $\overline{AB}$ and $\overline{CD}$.

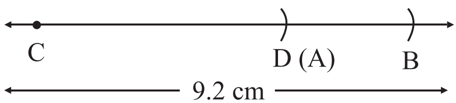
i.e, $\overline{AD} = \overline{AB} + \overline{CD}$

(b) **Steps of construction :** Two line segment CD and AB.



Step-1. Construct a line segment, say $\overline{CB}$, such that $\overline{CB} = \overline{CD} + \overline{AB}$.

Step-2. Draw a line l and mark point C on it.



Step-3. Take the compasses and measure $\overline{CD}$.

Step-4. Without disturbing the opening, place its needle at C and draw an arc cutting line l at D.

Step-5. Again adjust the compasses and measure the line segment AB.

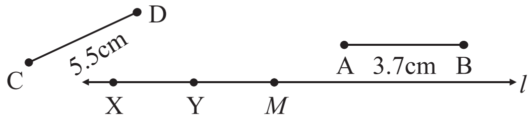
Step-6. Without disturbing the opening, place the pointer at point A on the line l and draw an arc cutting the line l and B.

Step-7. $\overline{CB}$ is the required line segment whose length is equal to the sum of the lengths of line segments CD and AB.

i.e., $\overline{CB} = \overline{CD} + \overline{AB}$.

(c) Steps of construction :

Step-1. Draw a line l of any length.

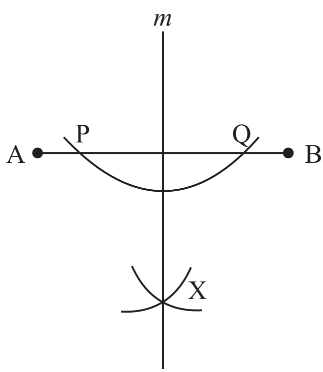


Step-2. Construct a line segment $\overline{XM}$ on the line l such that $\overline{XM} = CD$ as discussed earlier.

Step-3. Similarly, mark line segment $\overline{MY}$ on the line l. Cutt off point Y on the left of M, such that $\overline{YM} = \overline{AB}$.

The line segment XY, so obtained is the required segment whose length is the difference of the lengths of the two given line segment. This $\overline{XY} = \overline{XM} - \overline{YM}$ [$\because$ $\overline{XM} = \overline{CD}$ and $\overline{YM} = \overline{AB}$ or $\overline{XY} = \overline{CD} - \overline{AB}$

3. Steps of Construction :



Step-1. Draw a line segment $\overline{AB}$ of length 5 cm and mark point M outside the line segment AB.

Step-2. Taking M as the centre and with any convenient radius, draw an arc cutting $\overline{AB}$ at P and Q.

Step-3. Taking P and Q as centres and with radius more than half of PQ draw arcs below $\overline{AB}$ intersecting each other at X.

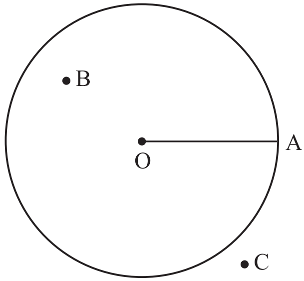
Step-4. Join M and X.

Hence, MX is the required perpendicular to the line segments $\overline{AB}$ from point M lying outside the line segment AB.

4. Steps of Construction :

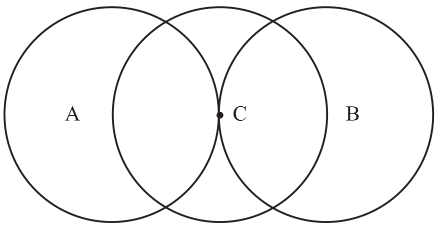
Step-1. Mark a point O on a sheet of paper, where a circle is to be drawn.

Step-2. Take a pair of compasses and measure 4.2 cm using a ruler.



Step-3. Without disturbing the opening of the compasses keep the needle at mark O and draw a complete arc holding the compasses from its knob. After completing one complete round we get the desired circle. At last marked point A, B and C.

5. Steps of construction :



Step-1. Mark a point O on a sheet of paper, where a circle is to be drawn.

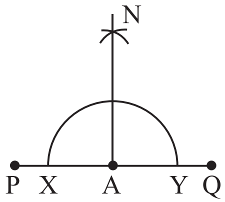
Step-2. Take a pair of compasses and measure any convenient (4 cm) using a ruler.

Step-3. Without disturbing the opening of the compasses keep the needle at mark O and draw a complete arc holding the compasses from its knob.

After completing one round, we get the desired circle.

Step-4. Similarly, we can make similar two circles with touch each other.

6. Steps of construction :



Step-1. Draw a line segment *PQ* of length 3.5 cm and make a point *A* on it.

Step-2. Taking *A* as the centre and with any convenient radius, draw an arc cutting *PQ* at *X* and *Y*.

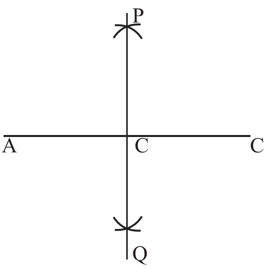
Step-3. Taking *X* and *Y* as centres and with any suitable radius arcs cutting each other at *N*.

Step-4. Join *A* and *N*.

Then *AN* is perpendicular to *PQ* passing through the point *A*.

Exercise 8.2

1. Steps of construction :



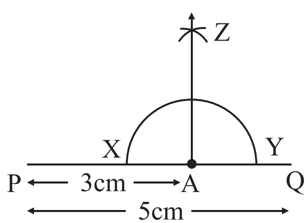
Step-1. Draw a line segment $AB = 9$ cm.

Step-2. With *A* as centre and radius more than half *AB*, draw arcs, one on each side of *AB*.

Step-3. With *B* as centre and the same radius as before, draw arcs, cutting the previously drawn arcs at *p* and *Q* respectively.

Step-4. Join *PQ*, meeting *AB* at *C*. Then $AC = BC$

2. Steps of construction :



Step-1. PQ be the given line and A be a point on it.

Step-2. With A as centre and taking any suitable radius draw an arc intersecting the line PQ at X and Y.

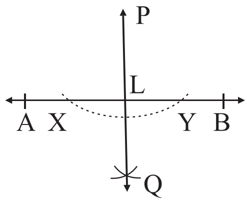
Step-3. With X and Y as centre and more than XA radius, draw two arcs on any side of line PQ and let them intersect at Z.

Step-4. Join AZ and produce. Then $AZ \perp PQ$.

3. Steps of construction :

1. AB be the given line and P be a point outside it.
2. With P as a centre and taking any suitable radius, draw an arc intersecting AB at X and Y.
3. With X as centre and a radius more than half XY, draw an arc.
4. With Y as centre and the same radius, draw another arc, which cuts the previously arc at Q.
5. Join PQ, meeting AB at L.

   Then PL is the required perpendicular on XY.

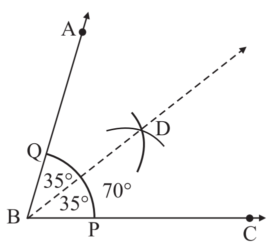


4. Steps of Construction :

Step-1. Draw an angle of 70° with the help of protractor.

Step-2. Taking B as the centre draw an arc $\overparen{PQ}$ and a radius greater than half of PQ, draw an arc.

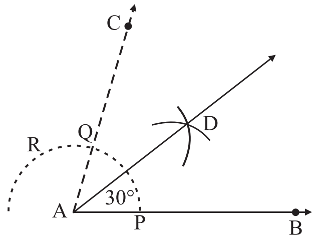
Taking Q as the centre and with the same radius draw another arc, cutting the previous arc at D.



Step-3. Join B and D to get the ray $\overrightarrow{BD}$.

Step-4. BD is the angular bisector of $\angle ABC$. Therefore, $\angle ABD = \angle DBC = 35°$ is the required angle.

5. **(a) Steps of construction :**



Step-1. Draw an angle of 60° with the help of compasses and ruler.

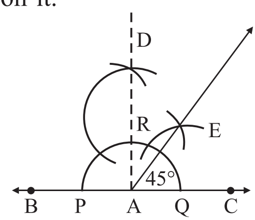
Step-2. Taking A as the centre draw an arc PR and a radius greater than half of PQ, draw an arc. Taking Q as the entre and with the same radius draw another arc, cutting the previous arc at D.

Step-3. Join AD to get the ray AD.

Step-4. AD is the angular bisector of $\angle CAB$. Therefore, $\angle DAB = 30°$ is the required angle.

(b) Steps of construction :

Step-1. Draw a line $\overleftrightarrow{BC}$ and mark a point A on it.



Step-2. Taking A as the centre and with any suitable radius, draw an arc PQ cutting BC at P and Q.

Step-3. Taking P and Q as the centres and any convenient radius, draw arc intersecting each other at D.

Step-4. Join A and D to get the ray $\overrightarrow{AD}$.

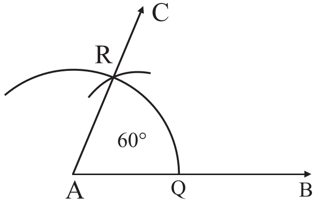
Step 5. Taking Q as a centre and a radius more than half of QR, draw an arc.

Step-6. Taking R as the centre and the same radius, draw an arc cutting the previous arc at E.

Step-7. Join A and E to get the ray $\overrightarrow{AE}$.

Step-8. $\overrightarrow{AE}$ is the angular bisector of $\angle DAC$. Therefore, $\angle DAE = \angle EAC = 45°$ is the required angle. Verify it by using a protractor.

(c) Steps of construction :



Step-1. Draw any ray AB.

Step-2. Taking A as the centre and with any suitable radius, draw an arc PQ that cuts AB at Q.

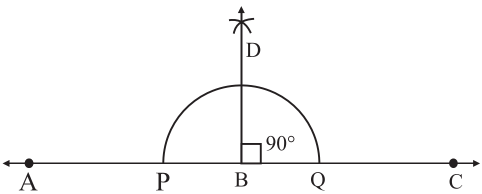
Step-3. Taking Q as the centre and a radius to AQ, draw an arc cutting the previous arc PQ at R.

Step-4. Join AR and produce it to get AC.

Step-5. $\angle BAC$ is the required angle equal to 60°.

(d) Steps of construction :

Step-1. Draw a line AC and mark a point B on it.



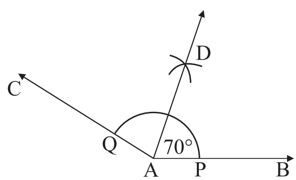
Step-2. Taking B as the centre and with any suitable radius, draw an arc PQ cutting AC at P and Q.

Step-3. Taking P and Q as the centres and with any convenient radius, draw arcs intersecting each other at D.

Step-4. Join B and D to get the ray BD.

Then, $\angle ABD = \angle DBC = 90°$ is the required angle.

6. Steps of construction :



Step-1. Draw an angle of 140° with the help of protractor.

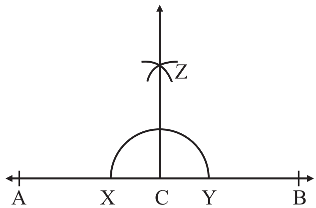
Step-2. Taking P as centre and a radius greater than half of PQ, draw an arc. Taking Q as the centre and with the same radius draw another arc, cutting the previous arc at D.

Step-3. Join A and D to get the ray AD.

Step-4. AD is the angular bisector of $\angle CAB$.

Therefore, $\angle CAD = \angle DAB = 70°$ is the required angle.

7. Steps of construction :



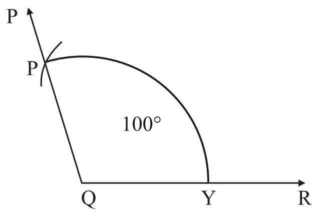
Step-1. AB be the given line and C be a point on it.

Step-2. With C as centre and taking any suitable radius draw an arc intersecting the line AB at X and Y.

Step-3. With X and Y as centre and more than XC radius, draw two arcs on any side of line AB and let them intersect at Z.

Step-4. Join CZ and produce. Then, $CZ \perp AB$.

8. Steps of construction :



Step-1. Draw an angle $\angle PQR = 100°$ with the help of protractor.

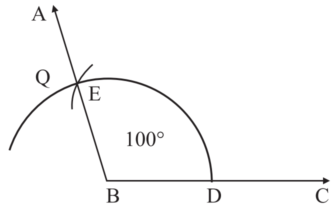
Step-2. With Q as centre and taking convenient radius draw an arc XY.

Step-3. Draw a line BC with using ruler.

Step-4. Place the needle of compasses on point Q and open it equal to the length of QY.

Step-5. Without disturbing the opening, place the needle of the compasses at point B and draw an arc intersecting the line BC at D.

Step-6. Now, place the needle of compasses on point D and open it equal to the length YX.



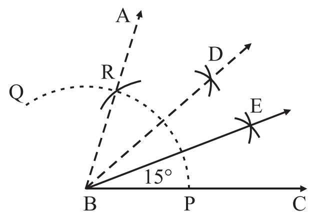
Step-7. Without disturbing the opening, place the needle of the compasses at point D and draw an arc intersecting the arc at E.

Step-8. Join the points AEB.

Hence, $\angle ABC = \angle PQR$

HOTS

1.



Steps of construction :

Step-1. Draw a ray $\overrightarrow{BC}$.

Step-2. Taking B as the centre and with any suitable radius, draw an arc PQ that cut BC and P.

Step-3. Taking P as the centre and a radius equal to BP, draw an arc cutting the previous arc PQ at R.

Step-4. Join BR and produce it to get BA.

Step-5. $\angle ABC$ is the required angle equal to 60°.

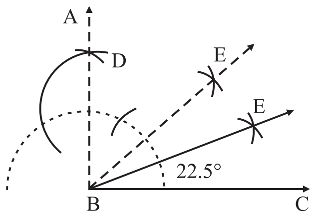
Step-6. Taking P as the centre and a radius greater than half of PR, draw an arc.Taking R as the centre and with the same radius draw another arc, cutting the previous arc at D.

Step-7. Join D and B to get the ray $\overrightarrow{BD}$.

Step-8. $\angle DBC$ is the required angle equal to 30°.

Step-9. Similarly, we can make $\angle EBC$ is the required angle equal to 15°.

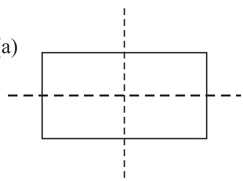
2. Steps of construction : As above like question no. 1

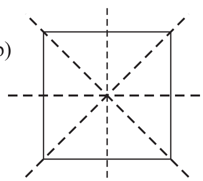


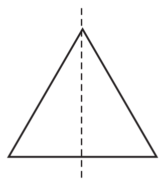
Chapter 9 Symmetry

Exercise 9.1

1.

(a)


(b)


(c)


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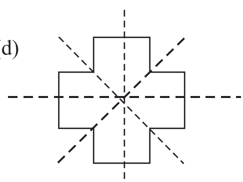

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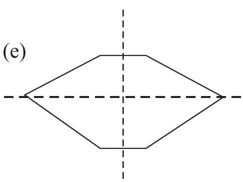
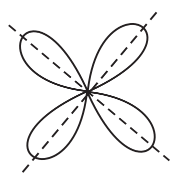
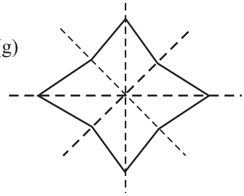
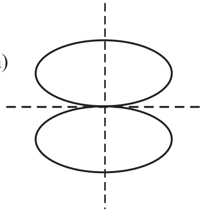
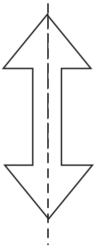


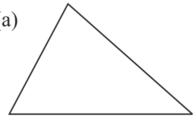
(f)


(g) 

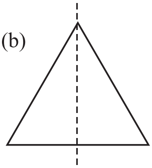
(h) 

(i) 

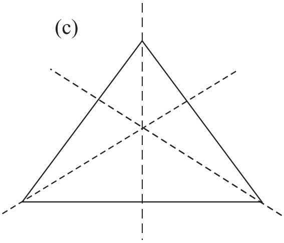
2.

(a) 

Scalene triangle

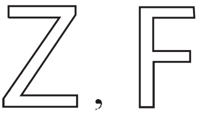
(b) 

Isosceles triangle

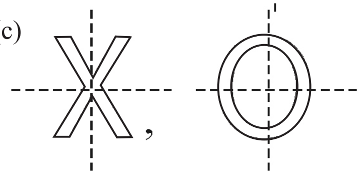
(c) 

Equilateral triangle

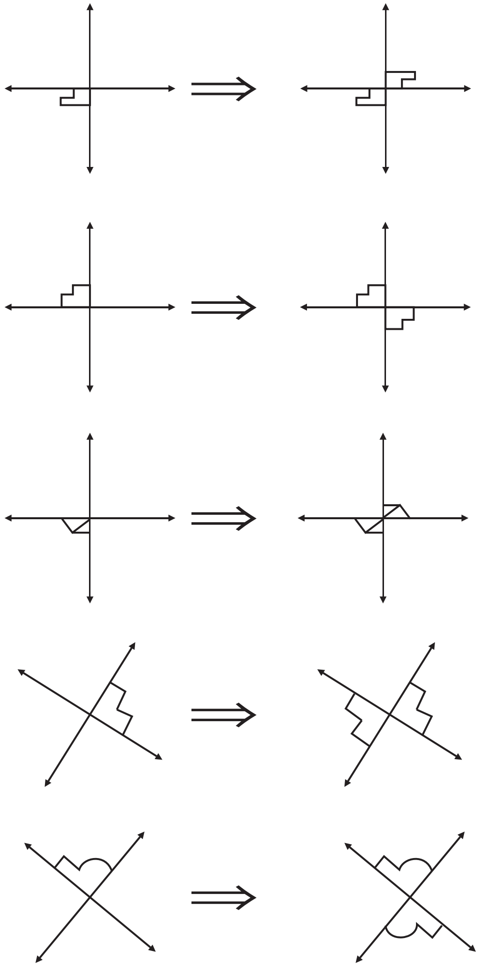
3.

(a) 

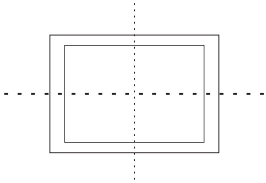
(b) 

(c) 

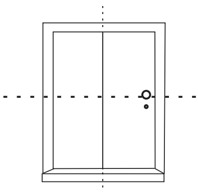
4.



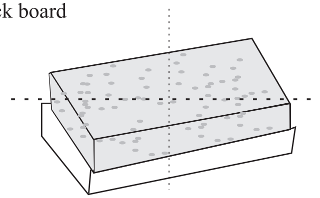
5.



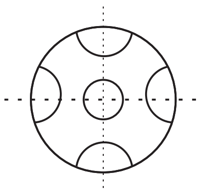
Black board



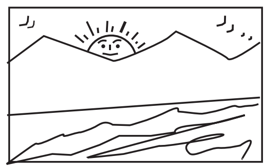
Door



Duster



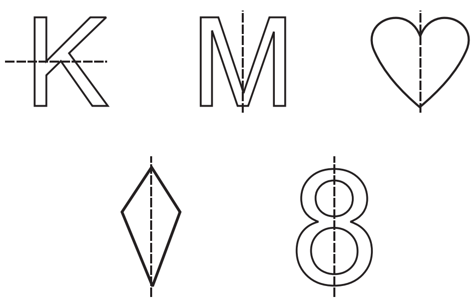
Foot ball



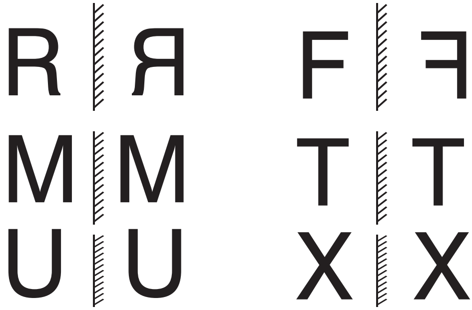
Scenery

Exercise 9.2

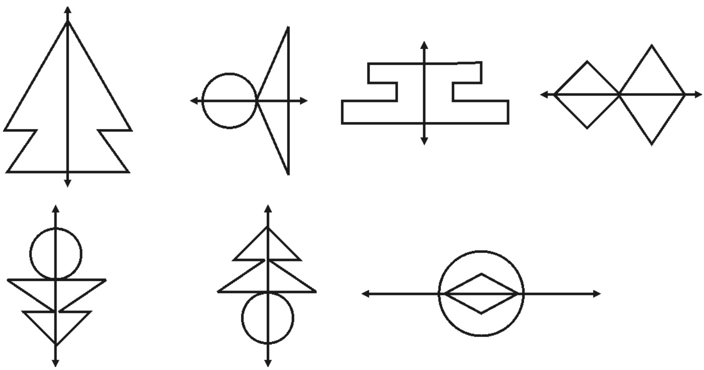
1.



2.



3.



4. Do it yourself

MCQs 1. (c) 2. (b) 3. (d) 4. (b)

Mental Maths :

Fill in the blanks :

1. A scalene triangle has **no** axis of symmetry.
2. An equilateral triangle has **three** axes of symmetry.
3. A rectangle has **two** axes of symmetry.
4. A square has **four** axes of symmetry.
5. A circle has **infinite** axes of symmetry.
6. The letter *M* has **one** axis of symmetry.
7. The letter *N* has **no** axis of symmetry.
8. The letter *X* has **two** axes of symmetry.

Chapter 10 The other Side of Zero

Exercise 10.1

1. (a) The opposite of – 8 is 8. (b) The opposite of – 2 is 2.

(c) The opposite of 6 is – 6. (d) The opposite of 15 is – 15.

2. (a) 30 km above sea level. (b) Spending ₹ 2500.

(c) An increase of 10. (d) Moving 7 km to the south.

3. (a) All integers between – 5 and 1 are – 4,– 3 , – 2, – 1 and 0.

(b) All integers between – 4 and 3 are – 3, – 2, – 1, 0, 1 and 2.

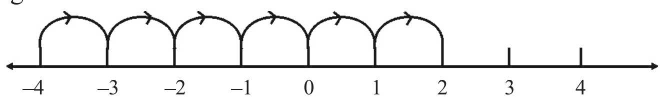
(c) All integers between – 6 and – 1 are –5, – 4, – 3, and – 2.

(d) All integers between 0 and 5 are 1, 2, 3 and 4.

(e) All integers between – 3 and 3 are – 2, – 1, 0, 1 and 2.

(f) All integers between – 2 and 0 is – 1.

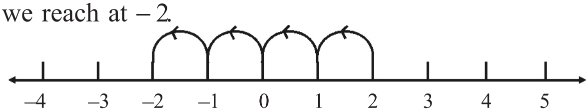
4. (a) On the number line, we start from – 3 and move 5 steps to the right and we reach at 2.



So, $-3+5=2$

Hence, 5 more than – 3 is 2.

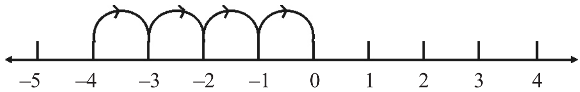
(b) On the number, line, we start from 2 and move 4 steps to the left and we reach at – 2.



So, $2-4=-2$

Hence, 4 less than 2.

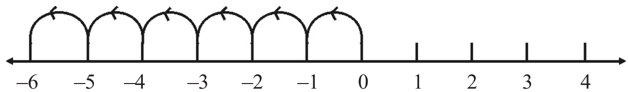
(c) On the numbers line, we start from – 4 and move 4 steps to the right and we reach at 0.



So, $-4+4=0$

Hence, 4 more than – 4.

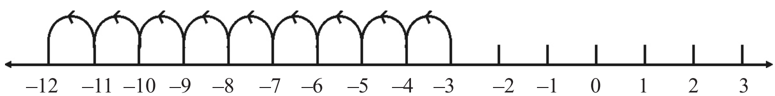
(d) On the numbers line, we start from 0 and move 6 steps to the left and we reach at – 6.



So, $0-6=-6$

Hence, 6 less than 0.

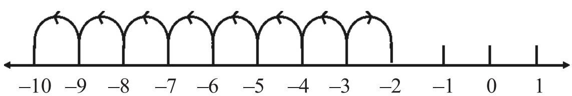
(e) On the number line, we start from – 12 and move 9 steps to the right and we reach at – 3.



So, $-12+9=-3$

Hence, 9 more than – 12 is – 3.

(f) On the number line, we start from – 2 and move 8 steps to the left and we reach at – 10.



So, $-2-8=-10$.

5. (a) – 123 or 12

Since, – 123 lies left of 12 on the number line,

∴ – 123 is smaller than 12.

(b) – 55 or – 35

Since, – 55 lies left of – 35 on the number line.

∴ – 55 is smaller than – 35

(c) – 135 or – 131.

Since, –135 lies left of –131 on the number line..

∴ –135 is smaller than –131.

(d) 33 or 11

Since, 11 lies left of 33 on the number line.

∴ 11 is smaller than 33.

(e) – 100 or – 90

Since, – 100 lies left of – 90 on the number line.

∴ – 100 is smaller than – 90.

(f) – 257 or – 389

Since, – 389 lies left of – 257 on the number line.

∴ – 389 is smaller than – 257.

6. (a) – 39, – 45

Since, – 45 lies left of – 39 on the number line.

∴ – 39 is greater than – 45.

(b) 0, 5

Since, 0 lies left of 5 on the number line.

∴ 5 is greater than 0.

(c) 210, – 405

Since, – 405 lies left of 210 on the number line.

∴ 210 is greater than – 405.

(d) $-150, -165$

Since, -165 lies left of -150 on the number line.

$\therefore$ -150 is greater than -165.

(e) $0, -9$

Since, -9 lies left of 0 on the number line.

$\therefore$ 0 is greater than -9.

(f) 140, 130

Since, 130 lies left of 140 on the number line.

$\therefore$ 140 is greater than 130.

7. (a) $-7 \boxed{<} -5$ (b) $0 \boxed{<} 2$ (c) $-6 \boxed{>} -8$

(d) $-9 \boxed{<} 2$ (e) $-3 \boxed{<} 0$ (f) $+5 \boxed{>} 1$

8. (a) $6, -10, 4, -5, 1, -2, 0, 15$

The increasing order is $-10 < -5 < -2 < 0 < 1 < 4 < 6 < 15$

(b) $-7, 6, 0, -2, -8, 7$

The increasing order is $-8 < -7 < -2 < 0 < 6 < 7$.

(c) $4, -3, 5, -8, -5, 1, 10$

The increasing order is $-8 < -5 < -3 < 1 < 4 < 5 < 10$

(d) $-19, 15, 10, -7, 8, 1, -2$

The increasing order is $-19 < -7 < -2 < 1 < 8 < 10 < 15$

9. (a) $-2, 5, -1, 0, 8$

The decreasing order is $8 > 5 > 0 > -1 > -2$

(b) $7, -3, -4, 0, 4, -10$

The decreasing order is $7 > 4 > 0 > -3 > -4 > -10$.

(c) $-10, 6, -1, 3, -5, 7$

The decreasing order is $7 > 6 > 3 > -1 > -5 < -10$

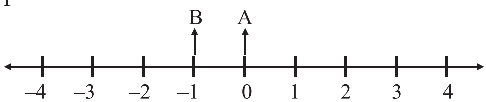
(d) $-15, 10, 8, -7, 0, 2$

The decreasing order is $10 > 8 > 2 > 0 < -7 < -15$

10. (a) $x > 4$

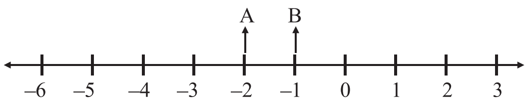
So, two possible integral values of x are 5 and 6, which are denoted by A and B.

(b) $x < 1$



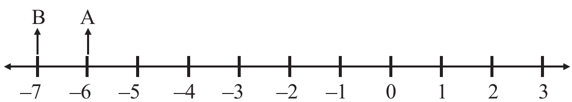
So, two possible integral values of x are 0 and -1, which are denoted by A and B.

(c) $x > -3$



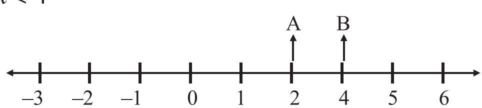
So, two possible integral values of x are -2 and -1, which are denoted by A and B.

(d) $x < -5$



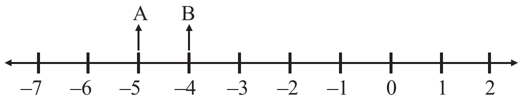
So, two possible integral values of x are -6 and -7, which are denoted by A and B.

(e) $1 < x < 4$



So, two possible integral values of x are 2 and 3, which are denoted by A and B.

(f) $-6 < x < -3$



So, two possible integral values of x are -5 and -4, which are denoted by A and B.

11. (a) $|-11|$ $= 11$ (b) $|0|$ $= 0$ (c) $|5|$ $= 5$ (d) $|-7|$ $= 7$

(e) $|8|$ $= 8$ (f) $|-2|$ $= 2$ (g) $|10|$ $= 10$ (h) $|-5|$ $= 5$

12. (a) $|-7| + |-2|$ $= 7 + 2 = 9$ (b) $|0| - |3|$ $= 0 - 3 = -3$ (c) $|-4| - |0|$ $= 4 - 0 = 4$

(d) $|-5| - |-5|$ $= 5 - 5 = 0$ (e) $|13| - |-7|$ $= 13 - 7 = 6$ (f) $|-9| + |9|$ $= 9 + 9 = 18$

13. (a) Zero is greater than every **negative** integer.

(b) The absolute value of zero is **zero.**

(c) There are **four** integers between 3 and -2.

(d) All natural numbers are **positive** integers.

14. (a) False (b) True (c) True (d) True (e) True (f) False

15. (a) The next three integers are 0, 5 and 10.

(b) The next three integers are 4, 2, and 0.

(c) The next three integers are -23, -28 and -33.

(d) The next three integers are 3, -1 and -5.

Exercise 10.2

1. (a) $3 + (-5)$ $= 3 - 5 = -2$ (b) $(-9) + 4$ $= -9 + 4 = -5$

(c) $5+(-5)$

$= 5-5=0$

(d) $(-1)+(-10)$

$=-1-10=-11$

(e) $3+0+(-5)$

$=3+0-5$

$=3-5=-2$

(f) $(-3)+(-2)+4$

$=-3-2+4$

$=-5+4=-1$

2. (a) $(-549)+435=-114$

(b) $362+(-623)=-261$

(c) $405+323=728$

(d) $(-323)+(-124)=-447$

3. (a) $(-326) + (-62) = -388$

(b) $(-1945) + 645 = -1300$

(c) $99 + 699 = 798$

(d) $2045 + (-532) = 1513$

4. (a) $325+(25+15)$

$=325+40=365$

(b) $(600+50)+54$

$=650+54=704$

(c) $(902+88)+105$

$=990+105=1095$

(d) $835+(19+238)$

$=835+257=1092$

5. (a) $(-6)+(-12)+15+(-8)$

$=-6-12+15-8$

$=15-[6+12+8]$

$=15-26=-11$

(b) $42+(-63)+33+41$

$=42+33+41-63$

$=116-63=53$

(c) $153+(-97)+63+(-54)$

$=153+63-(97+54)$

$=216-151=65$

(d) $1095+(-98)+20+(-33)$

$=1095+20-(98+33)$

$=1115-131=984$

6. (a) The additive inverse of (-10) is 10.

(b) The additive inverse of 2015 is -2015.

(c) The additive inverse of -1315 is 1315.

(d) The additive inverse of 15 is -15.

7. (a) The successor of -357 is $-357+1=-356$

(b) The successor of 475 is $475+1=476$

(c) The successor of -1019 is $-1019+1=-1018$

(d) The successor of 535 is $535+1=536$.

8. (a) The sum of a positive and a negative integer is always negative. **False**

(b) 1 is the identity element for addition of integers. **False**

(c) Additive inverse of -237 does not exist. **False**

(d) -31 is the successor of -32. **False**

Exercise 10.3

1. (a) 36 from -292

$=-292-36=-328$

(b) -318 from -318

$=(-318)-(-318)$

$=-318+318=0$

(c) 0 from -453

$=(-453)-0=-453$

(d) -453 from 0

$0-(-453)=453$

(e) -450 from 450

$=450-(-450)$

$=450+450=900$

(f) -68 from -55

$=(-55)-(-68)$

$=-55+68=13$

2. (a) $-10+\boxed{10}=0$

(b) $13+(-11)=\boxed{2}$

(c) $232+\boxed{(-272)}=-40$

(d) $\boxed{-250}+215=-35$

(e) $-109+\boxed{(-101)}=-210$

(f) $-15+(-16)=\boxed{-31}$

3. (a) $(-5)+(5)\boxed{=}9+(-9)$

(b) $30-(-62)\boxed{=}62+30$

(c) $13+(-8)\boxed{<}13+8$

(d) $15+(-9)\boxed{>}(-15)-(-9)$

(e) $-65+(-40)\boxed{>}(-100)+(-25)$

(f) $(-32+392)\boxed{>}(-32)-392$

4. (a) $-15+[(-5)-(-10)]$

$=-15+(-5+10)$

$=-15+5=-10$

(b) $[-100-(-25)]+75$

$=(-100+25)+75$

$=-75+75=0$

(c) $32+[(-20)-40)]-(10)$

$= 32+(-20-40)+10$

$= 32-60+10$

$= 42-60=-18$

(d) $21+[(-7)-35]$

$= 21+(-42)$

$= 21-42=-21$

(e) $[76-(-51)]+[(-31)-20]$

$= [76+51]+[-31-20]$

$= 127-51$

$= 76$

(f) $-120+[(-89)-92]$

$= -120+(-89-92)$

$= -120+(-181)$

$= -120-181$

$= -301$

5. (a) The predecessor of $10=10-1=9$

(b) The predecessor of $-579=-579-1=-580$

(c) The predecessor of $688=688-1=687$

(d) The predecessor of $-453=-453-1=-454$

(e) The predecessor of $200=200-1=199$

(f) The predecessor of $-1000=-1000-1=-10001$

(g) The predecessor of $350=350-1=349$

(h) The predecessor of $-15=-15-1=-16$

6. The given operation is $a * b = a-(b+1)+(-2)$

(a) $(-3)*(-5)$

$= (-3)[(-5)+1]+(-2)$

$= -3-(-5+1)-2$

$= -5-(-4)$

$= -5+4=-1$

(b) $2*(-3)$

$= -2-\{(-3)+1\}+(-2)$

$= 2-(-3+1)-2$

$= -2$

(c) $(-5)*(-3)$

$= (-5)-\{(-3)+1\}+(-2)$

$= (-5)-(-3+1)-2$

$= -5+2-2=-5$

(d) $(-3)*2$

$= (-3)-(2+1)+(-2)$

$= -3-3-2=-8$

Take a first part of Questions No. 6.

(a) $(-3) * (-5)$

$a * b = b * a$

LHS $= a * b = a - (b+1) + (-2)$

$= (-3) - \{(-5)+1\} + (-2)$

$= -3 - (-5+1) - 2$

$= -3 + 4 - 2$

$= -5 + 4 = -1$

RHS $= b * a = b - (a+1) + (-2)$

$= (-5) - \{(-3)+1\} + (-2)$

$= -5 - (-2) - 2$

$= -5 + 2 - 2 = -5$

Since, LHS $\neq$ RHS

Hence, $a * b \neq b * a$

7. The sum of two integers $= -20$

One integer $= -9$

Other integer $= ?$

Other integer $= -20 - (-9)$

$= -20 + 9 = -11$

Hence, -11 is the other integer.

8. The distance between two places $= 40 \text{ m} - (-31 \text{ m})$

$= 40 \text{ m} + 31 \text{ m} = 71 \text{ m}$

9. $[100 - (-210)] + (-55)$

$= (100 + 210) - 55$

$= 310 - 55 = 255$

10. $4 - 7 + (-5) - (-3) + 5$

$= 4 - 7 - 5 + 3 + 5$

$= (4 + 3 + 5) - (7 + 5)$

$= 12 - 12 = 0$

Exercise 10.4

1. (a) $78+(-15)$
$= 78-15=63$

(b) $620+(-315)$
$= 620-315=305$

(c) $-48+89$
$= 89-48=41$

(d) $-1567+312$
$= -1255$

(e) $(-882)+205+(-20)$
$= -882+205-20$
$= -(882+20)+205$
$= -902+205=-697$

(f) $-7+7=0$

(g) $6+(-11)$
$= 6-11=-5$

2. (a) 0 from (-20)
$= (-20)-0$
$= -20$

(b) 460 from 640
$= 640-460=180$

(c) -315 from 0
$= 0-(-315)=315$

(d) -239 from 200
$= 200-(-239)$
$= 200+239=439$

(e) 15 from (-16)
$= (-16)-15$
$= -16-15=-31$

(f) 25 from 0
$0-25=-25$

(g) 2 from (7)
$= 7-2=5$

(h) 3 from 2
$2-3=-1$

3. (a) $(-8)\times 3=-24$

(b) $130\times(-10)=-1300$

(c) $(-12)\times(-12)=+144=144$

(d) $8\times(-5)\times(-4)\times(-6)$
$= -40\times 24=-960$

(e) $(-3)\times(-5)\times(-2)\times 5\times(-9)$
$= 15\times(-10)\times(-9)$
$= (-150)\times(-9)=1350$

(f) $(-1)\times(-3)\times(+6)$
$= 3\times(+6)=18$

(g) $(-1)\times 6=-6$

(h) $0\times(-8)=0$

4. (a) $(-64) \div 16$

$= -64 \times \frac{1}{16}$

$= -\frac{64}{16} = -4$

(b) $(-35) \div (-1)$

$= -35 \times \frac{1}{-1}$

$= \frac{-35}{-1} = 35$

(c) $0 \div (-8) = 0$

(d) $15625 \div (-25)$

$= 15625 \times \frac{1}{-25}$

$= \frac{15625}{-25} = -625$

(e) $6 \div (-6)$

$= \frac{6}{-6} = -1$

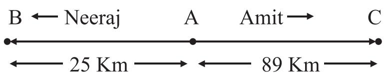
(f) $-56 \div 8$

$= 7$

(g) $99 \div (-99)$

$= \frac{99}{-99} = -1$

5.



Neeraj travelled North = 25 km

Amit travelled South = 89 km

So, the distance between the final destination of the two points *B* to *C* = 25 km + 89 km = 114 km

6. $[(-15) + 35] - [(-8) + (-28)]$

$= (-15 + 35) - (-8 - 28)$

$= 20 + 36 = 56$

7. The sum of two integers $= -250$

One integer $= -172$

Other integer = ?

Other integer $= (-250) - (-172)$

$= -78$

8. Let the integer be x.

$x \div (-1) = -42$

$x \times \frac{1}{(-1)} = -42$

$x = (-42) \times (-1) = 42$ (By cross multiplication)

Hence, the required integer is 42.

9. Let the integer be x.

Then, $x \times (-1) = 85$

$x = 85 \div (-1)$

$x = -85$

Hence, the required integer is -85.

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

Mental Maths :

1. False 2. False 3. True 4. False 5. True 6. False 7. True 8. True