Chapter-1 : Patterns in Mathematics

Assessment Time 1.1

1. **Identify the following sequences and write next three terms:**
   a. 1, 2, 4, 8, ...In this sequence, each term is multiplied by 2.
   The next three terms are: **16, 32, 64**.
   b. 1, 3, 6, 10, ... This sequence represents the triangular numbers where each term is the sum of the first n natural numbers.
   The next three terms are:
   15 (1 + 2 + 3 + 4 + 5), **21** (1 + 2 + 3 + 4 + 5 + 6) and **28** (1+2+3+4+5+6+7).
   c. 1, 8, 27, ...This sequence consists of perfect cubes:
   (13), (23), (33).
   The next three terms are: 64 (4^3), 125 (5^3), and 216 (6^3).
   d. 1, 3, 9, 27, ...In this sequence, each term is multiplied by 3.
   The next three terms are: 81, 243 and 729.
   e. 1, 2, 4, 7, ...This sequence increases by consecutive integers: +1 from the first to second term (+1), +2 from the second to third term (+2), +3 from the third to fourth term (+3).
   Following this pattern, the next three terms are:
   11 (+4), 16 (+5), and 22 (+6).

Assessment Time 1.2

1. The numbers 1, 3, 6, 10, 15, ... are known as triangular numbers because they can be arranged in the shape of an equilateral triangle.
   For example:
   1 can be represented as a single dot.
   3 can be arranged as a triangle with three dots (one on top and two below).
   6 can form a larger triangle with six dots (one on top, two in the second row, and three in the third).
   The sequence 1, 4, 9, 16, 25, ... is referred to as square numbers because they can be visually represented as squares.

For instance:

1 is a single unit square.

4 can be arranged in a square formation of two by two dots.

9 forms a three by three square.

The series 1, 8, 27, 64, 125,... represents cubic numbers because they correspond to cubes in three-dimensional space.

For example:

1 is a cube with one unit volume.

8 can be visualized as a cube of dimensions two by two by two.

Similarly, 27 is represented by a cube of dimensions three by three by three.

2. To visualize the sequences of powers of 2 and powers of 3 pictorially:

   Powers of 2 (2^0, 2^1, 2^2, ...): You can represent this sequence using binary trees or doubling shapes. Each level of the tree could represent an exponent where each node branches into two further nodes. Alternatively, you could visualize it with rectangles that double in area for each power (e.g., starting from a small square and doubling its size).

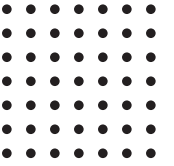
   Powers of 3 (3^0, 3^1, 3^2, ...): A way to visualize this sequence could involve using stacked layers or pyramids. Each layer could represent an exponent where each layer contains three times more blocks than the previous one. This creates a pyramid-like structure that grows larger as you increase the exponent.

3. The sequence of numbers you provided—1, 7, 19, 37—represents hexagonal numbers. Hexagonal numbers are figurate numbers that can be arranged in the shape of a hexagon. Thus, the next number in the sequence is 45.

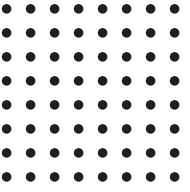
4. To create dot patterns representing the square numbers provided, we will visualize each square number as a grid of dots. Each square number corresponds to the total number of dots arranged in a perfect square formation. Here are the dot patterns for each of the specified square numbers:

a. 36 (6 × 6)

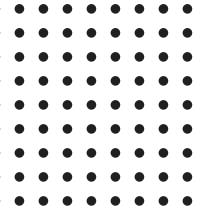
b. 49 (7 × 7)



c. 64 (8 × 8)



d. 81 (9 × 9)



Assessment Time 1.3

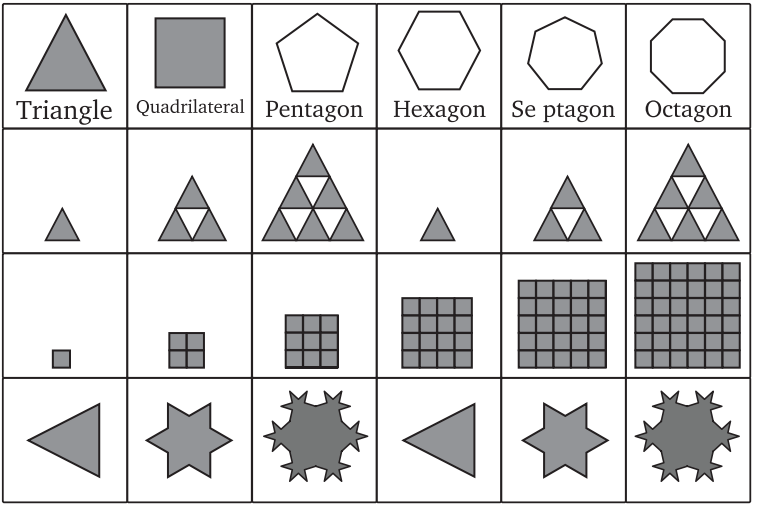
1. Identify the following patterns and draw three more pattern.

a.

b.

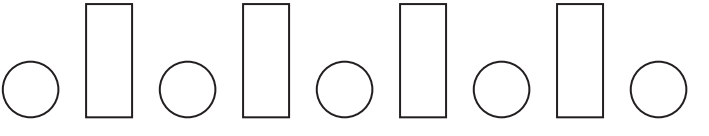
c.

d.

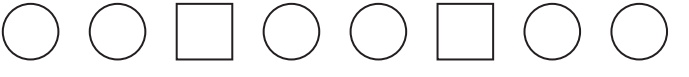


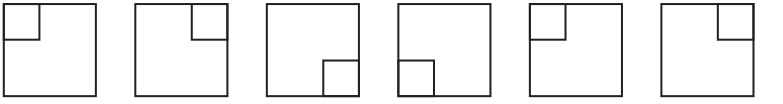
2. Complete the following patterns:

a.



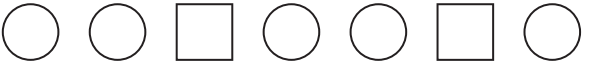
b.



c. 

Mental Zone

1. What will be the next shape in the pattern?



2. Name the type of pattern: 1, 3, 6, 10, 15 **Triangular**
3. Find the missing value in the geometric pattern.
   120, 60, **30**, 15, **7.5**
4. Complete the pattern: AB, BC, CD, DE, **EF**, **FG**
5. Complete the pattern: 10, 13, 16, 19, **22**, **25**

Multiple Choice Questions

Tick (✓) the correct option:

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

Chapter-2 : Lines and Angles

Assessment Time 2.1

1. **Fill in the blanks:**
   a. A point has **no** dimension.
   b. A ray has **one** end point.
   c. A line has **no fixed** length.
   d. **Infinite lines can** pass through one point.
2. **Look at the adjoining figure and name:**
   a. Points : *O, A, B, D, E, F, G*
   b. Line segments : *BD*
   c. Rays : *OG, DE, OA*
   d. Lines : *AD*
3. **Look at the adjoining figure and name:**
   a. Collinear points : *P, S, T ; A, S, U, B*
   b. Four rays : *SV, US, TQ, TR*
   c. Four lines : *AB, CD, RS, PQ*
   d. Two intersecting lines : *AB, PQ* and *CD, RS*

4. **Define the following:** (Do Yourself)

Assessment Time 2.2

1. **Fill in the blanks:**
   a. The common end point is called the **vertex** of the angle.
   b. The interior of the angle extends **infinitely.**
   c. We use **protractor** to draw angles.
2. **Match the following:**

A	B
a. Acute angle	(i) Half of a revolution.
b. Right angle	(ii) Between $\frac{1}{4}$ and $\frac{1}{2}$ of a revolution.
c. Obtuse angle	(iii) More than half of a revolution.
d. Straight angle	(iv) Less than one-fourth of a revolution.
e. Reflex angle	(v) One-fourth of a revolution.

3. **Name the vertex and arms of the following angles:**
   (a) O, $\overrightarrow{OA}$, $\overrightarrow{OB}$ (b) Q, $\overrightarrow{QP}$, $\overrightarrow{QR}$
   (c) O, $\overrightarrow{OM}$, $\overrightarrow{ON}$
4. **Write another name for $\angle 1$, $\angle 2$, $\angle 3$, $\angle 4$ and $\angle 5$:**
   $\angle 1 = \angle BAC$, $\angle 2 = \angle B$, $\angle 3 = \angle BCA$, $\angle 4 = \angle D$, $\angle 5 = \angle DAC$
5. **Name the points which are:**
   (a) In the interior of : *A, B, C, L*
   (b) In the exterior of : *M, N, O, P, Q*
6. **Write the name of adjacent angles in the following figures:**
   (a) $\angle AOB$, $\angle BOC$
   (b) $\angle AOB$, $\angle OBC$; $\angle BOC$, $\angle COD$
7. **Compare the following angles, using trace paper:** (Do yourself)
8. **Draw the following angles and classify them as acute, obtuse, right, straight, reflex and complete angle:** (Do yourself)
9. **Where will the hand of a clock stop if it:**
   a. $\frac{1}{4}$ of a revolution $= \frac{1}{4} \times 360° = 90°$
   It starts from 6, it will stop at 9.

b. $\frac{3}{4}$ of a revolution $= \frac{3}{4} \times 360°$
$= 270°$

It starts from 3, it will stop at 12.

c. One revolution $= 360°$

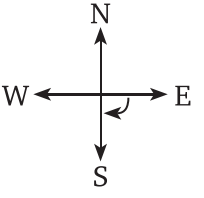
If starts from 12, it will stop at 12.

d. $\frac{1}{2}$ of a revoution $= \frac{1}{2} \times 360° = 180°$

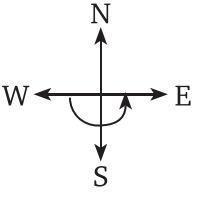
It starts from 9, it will stop at 3.

10. Which direction will you face if you start facing :

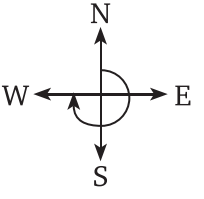
a. South



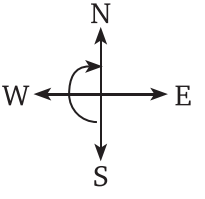
b. East



c. West



d. North



Critical Thinking Skills

Angle at 3:30

Minute Hand angle

- At 30 minutes, the minute hand is at 6, which is $6 \times 30 = 180°$ from 12.
- At 3 hours, the hour hand is at 3, which is $3 \times 30 = 90$ degrees from 12.
- In 30 minutes, the hour land moves an additional $30 \times 0.5 = 15$ degrees.
- Total hour angle is $90 + 15 = 105$ degrees
- The angle between the hand is $180° - 105° = 75°$ degrees.

Angle at 8:30

Minute hand Angle:

- At 30 minutes, the minute hand is at 6, which is $6 \times 30 = 180°$ from 12.

Hour Hand Angle

- At 8 hours, the hour hand is 8, which is $8 \times 30 = 240$ degrees from 12.
- In 30 minutes, the hour hand moves an additional $30 \times 0.5 = 15$ degrees.
- Total hour hand angle is $240 + 15 = 255$ degrees.

Angle Difference

- The angle between the hand is $|255° - 180°| = 75°$ degrees.

Revision Time

1. **Look at the following figure and name:**
   a. Four line segments : *IK, KL, IJ, KM*
   b. Four rays : *IA, MB, MD, JG*
   c. Four lines : *AB, GD, EF, GH*
2. **How many angles are forming in the following figures and name them?**
   a. 6 angles : *∠BAC, ∠DAC, ∠ADC, ∠DCA, ∠ACB, ∠BCA*
   b. 12 angles : *∠A, ∠AFE, ∠AEF, ∠B, ∠C, ∠BFD, ∠DFE, ∠FDE, ∠FED, ∠DEF, ∠DEC, ∠EDC*
3. **In the adjoining figure, which of the following statements are true and which are false?**
   a. True b. True c. False d. True
4. **By general observation, state which angle is greater in given pairs of angles?** (Do Yoursefl)
5. **Measure and classify each of the following angles as an acute, right, obtuse, straight, reflex and complete angle:** (Do Yoursefl)
6. **State the kind of angle that is formed between the following directions:**
   a. straight angle b. right angle c. right angle

7. **How many right angles do you make if you start facing:**
   a. two b. three
   c. three d. one
8. **Which direction will you face if you start facing:**
   a. South b. South
9. **Find the magnitude of the angle formed between the two hands of a clock at the following times:**
   a. 120° b. 15° c. 82.5°

Mental Zone

1. A line-segment has **definite** length.
2. A line AB is denoted by $\overrightarrow{AB}$.
3. Opposite edges of a scale are **parallel**.
4. A ray has **one** end point.
5. **One** line can be drawn through collinear points.
6. Number of lines can be drawn through two points **one**.
7. Protractor is also called **D**.
8. At 6 o'clock, angle between two hands of a clock is of **180°**.

Multiple Choice Questions

Tick (✓) the correct option:

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

Chapter-3 : Number Play

Assessment Time 3.1

1. **Colour the supercells in the following table:**

a.

43	58	51	67	78	68	92	85

b.

200	275	576	680	340	780	109	280

c.

52	76	83	78	59	68	95	75

d.

458	379	634	528	479	376	814	759

2. **Fill in the table below with only 4-digit numbers such that the supercells are exactly the coloured cells.**

a.

3467	7432	5463	7285	8259	3769	4563	2345

b.

4528	5632	6132	4728	2456	5429	4569	2345

Note: Answer of this question maybe different.

3. **Fill the table below such that we get as many supercells as possible.**

use only even numbers between 50 and 300 without repetitions:

a.

52	56	54	60	58	72	70	76

b.

82	84	80	88	86	96	90	104

Critical Thinking Skills

No, No

Assessment time 3.2

1. **Identify the numbers marked on the number lines below and label the remaining positions. Also encircle the largest number.** (Do yourself)

Assessment time 3.3

1. Three numbers whose sum is 8 can be: 2, 3, and 3.
2. Three numbers whose sum is 12 can be: 2, 4, and 6.
3. Three numbers whose sum is 14 can be: 3, 7, and 4.
4. Three numbers whose sum is 18 can be: 4, 6, and 8.
5. To find the sum of the digits of all numbers between 50 and 110:

   The numbers are: 50, 51, ..., up to 110. - The sum of the digits for each number is calculated as follows:

   For example: For number 50: Sum of digits = 5 + 0 = 5

   For number 51: Sum of digits = 5 + 1 = 6

   Continuing this way until number 110.

   The total sum of the digits from all these calculations results in a pattern that increases incrementally as the tens place remains constant while the units place cycles through from 0 to 9.

Observing this pattern reveals that as you move from one decade to the next (e.g., from the fifties to sixties), there is a consistent increase in the overall digit sums due to the increasing tens digit.

Critical Thinking Skills

tth	th	h	t	u
1	2	4	2	1

Write the number in words: Twelve thousand four hundred twenty-one

Assessment Time 3.4

1. 297

   A = 972 → A = 963
   B = 279 → B = 369
   C = 972 – 279 → C = 963 – 369
   = 693 → = 594

   A = 594 → A = 954
   B = 495 → B = 459
   C = 954 – 459 → C = 954 – 459
   = 459 → = 495

2. Sum and Difference of Smallest and Largest 4-Digit Palindrome:

   The smallest four-digit palindrome is 1001 and the largest is 9999.

   Sum: 1001 + 9999 = 11000

   Difference: 9999 - 1001 = 8998

3. Sum and Difference of Smallest and Largest 5-Digit Palindrome:

   The smallest five-digit palindrome is 10001 and the largest is 99999.

   Sum: 10001 + 99999 = 110000

   Difference: 99999 - 10001 = 89998

4. Minutes until Next Palindromic Time from 10:01:

   The next palindromic time after 10:01 is at **10:01**, which occurs again at 10:10.

   Therefore, from 10:01 to the next palindromic time (10:10), there are 9 minutes.

5. Rounds to Reach Kaprekar Constant from Number 5683: Starting with the number 5683, we perform the following steps:

   Step 1: Arrange in descending order 8653, ascending order 3568; difference = 8653 - 3568 = 5085

   Step 2: Repeat with 5085: Arranged 8505, ascending 0558; difference = 8505 - 558 = 7947

   Step 3: With 7947, arrange 9747, ascending 4779; difference = 9747 - 4779 = 4968

   Step continued until reaching Kaprekar constant (6174): It takes a total of 7 rounds to reach the Kaprekar constant from the number 5683.

6. Possible Three-Digit Palindromes Using Digits {1,2,3}:

   The three-digit palindromes that can be formed using the digits {1,2,3} are: 111, 121, 131, 212, 222, 232, 313, 323.

Assessment Time 3.5

1. **Using the numbers in the boxes, you are allowed to use both addition and subtraction to get the following numbers:**
   a. 32000 + 5000 – 3000 + 900
   b. 5000 – 2000 + 3000 – 980
   c. 14500 + 2000 – 3000 + 980
   d. 32000 – 14500 + 2000 – 980
2. **Write an example for each of the following:**
   a. Sum of two 5-digit numbers whose sum is 96450.
      Example: 48230 + 48220 = 96450
   b. Sum of 5-digit number and 3-digit number to give a 6-digit number.
      Example: 98765 + 235 = 99000
   c. Sum of two 4-digit numbers whose sum is 6-digit number is impossible.

Assessment Time 3.6

1. a. Sum = $10 \times 6 + 15 \times 4 + 20 \times 4 + 25 \times 4 + 30 \times 4$
   $= 60 + 60 + 80 + 100 + 120 = 420$
   b. Sum = $15 \times 27 + 30 \times 18$
   $= 405 + 540 = 945$

c. Sum $= 18 \times 7 + 22 \times 7$
$= 126 + 154 = 280$

d. Sum $= 10 \times 4 + 20 \times 6 + 30 \times 4 + 10 \times 6 + 35 \times 4$
$+ 20 \times 6 + 35 \times 4 + 15 \times 6 + 30 \times 4 + 10 \times 6$
$+ 25 \times 6 + 20 \times 6 + 15 \times 4$
$= 40 + 120 + 120 + 60 + 140 + 120 + 140 + 60$
$+ 120 + 60 + 150 + 120 + 60$
$= 1340$

e. Sum $= 100 \times 12 + 50 \times 12 + 25 \times 12$
$= 1200 + 600 + 300 = 2100$

Assessment time 3.7

1. For 84:

84 is even: $\frac{84}{2} = 42$, 42 is even: $\frac{21}{2} = 21$,

21 is odd: $(3 \times 21) + 1 = 64$, 64 is even: $\frac{64}{2} = 32$,

32 is even: $\frac{32}{2} = 16$, 16 is even: $\frac{16}{2} = 8$,

8 is even: $\frac{8}{2} = 4$, 4 is even: $\frac{4}{2} = 2$,

2 is even: $\frac{2}{2} = 1$

Thus, starting from 84, we reach 1.

2. For 71:

71 is odd: $(3 \times 71) + 1 = 214$, 214 is even: $\frac{214}{2} = 107$,

107 is odd: $(3 \times 107) + 1 = 322$,

Continuing this process leads to: Eventually reaching 1 after several iterations. Thus, starting from 71, we also reach 1.

3. For 21:

Starting with an odd number: $(3 \times 21) + 1 = 64$

Following similar steps as before leads to:

Eventually reaching 1.

Thus, starting from 21, we reach 1 as well.

4. For 22:
   Since it's even: Start with dividing by two repeatedly:
   Following this process leads to: Eventually reaching 1.
   Thus, starting from 22, we too reach 1.

Assessment Time 3.8

1. Do Yourself
2. Do Yourself
3. Total number of students = 95 × 50 = 2150
4. Do yourself
5. Do yourself
6. Not possible because there are only 8760 hours on 365 days.

Revision Time

1. Do yourself
2. One possible solution is:
   5-digit number: 18,000
   3-digit number: 300
   3-digit number: 370
   Sum = 18,000 + 300 + 370 = 18,670
4. Collatz Conjecture for Starting Number 100:
   The Collatz Conjecture states that for any positive integer, if you follow a specific sequence of operations (if the number is even, divide it by 2; if it is odd, multiply it by 3 and add 1), you will eventually reach the number 1.
   For the starting number 100, the sequence is as follows:
   100 (even) → 50 (even) → 25 (odd) → 76 (even) → 38 (even) → 19 (odd) → 58 (even) → 29 (odd) → 88 (even) → 44 (even) → 22 (even) → 11 (odd) → 34 (even) → 17 (odd) → 52 (even) → 26 (even) → 13 (odd) → 40 (even) → 20 (even) → 10 (even) → 5 (odd) → 16 (even) → 8 (even) → 4 (even) → 2 (even) → 1.
   Thus, the Collatz Conjecture holds true for the starting number of 100.
5. Largest and Smallest Odd-Digit Numbers Between 45,000 and 85,000: The largest five-digit number with all odd digits within

this range is 79,753, and the smallest is 59137. Among these numbers, 59137 is closest to 50,000.

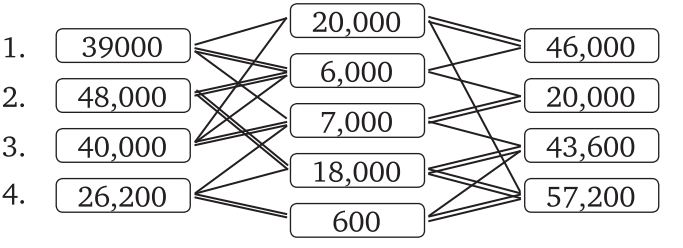
6. Do yourself
7. Do yourself
8. Number Pattern Creation Between Selected Range:

   Choosing a number between 210 and 390, let's select 250 to create a pattern:

   Pattern: 250, 252, ... ,270.
9. Palindromic patterns are sequences that read the same forwards and backwards. Two examples include:

   Example One: 121, 1331.
10. Four Palindromic Numbers Using Digits [1,2,3]: The four palindromic numbers using these digits are: 121, 131, 212, 232.

Mental Zone



Multiple Choice Questions

Tick (✓) the correct option:

1. (b) 2. (c) 3. (b) 4. (d) 5. (c)

Chapter-4: Data Handling and Presentation

Assessment time 4.1

1. **Marks obtained by 32 students in a maths class test out of 50 marks are given below:**

   40, 10, 5, 10, 6, 40, 45, 45, 50, 49, 48, 1, 6, 8, 10, 19, 40, 45, 42, 40, 10, 10, 15, 20, 25, 40, 50, 40, 10, 15, 30, 40.

Marks	Tally Marks	Frequency
1	|	1
5	|	1

6	||	2
8	|	1
10	𝍸 |	6
15	||	2
19	|	1
20	|	1
25	|	1
30	|	1
40	𝍸 ||	7
42	|	1
45	|||	3
48	|	1
49	|	1
50	||	2
		32

2. a. Town D
   b. Town B
   c. Number of four whealers in town C = $8 \times 10 = 80$
   d. Total number of four whealers in 5 towns
   $= (9 + 7 + 8 + 11 + 10) \times 10$
   $= 45 \times 10 = 450$

3.

Number	Tally Marks	Frequency
1	𝍸	5
2	||||	4
3	||||	4
4	𝍸	5
5	𝍸 |	6
6	𝍸 |	6
	Total	30

4.

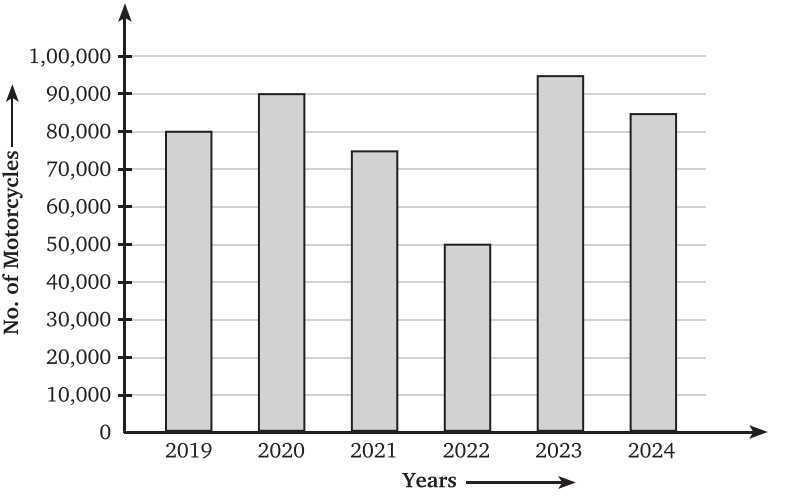
Weight	Tally Marks	Frequency
10	|	1
12	||	2
15	|	1
18	||	2
22	|	1
25	||	2
27	||	2
28	||||	4
29	||	2
30	|||	3
		20

5. a. Mobile phones sold on Sunday = $8 \times 5 = 40$
   b. Sunday
   c. Mobile phones sold on Monday = $7 \times 5 = 35$
   Mobile phones sold on Tuesday = $3 \times 5 = 15$
   Difference = $35 - 15 = 20$
   d,. Total mobile phones sold during week
   $= (8 + 7 + 3 + 4 + 7 + 5 + 2) \times 5$
   $= 35 \times 5 = 180$
6. Do yourself
7. Do yourself
8. a. Do yourself
   b. D
   c. E
   d. Do yourself

Assessment Time 4.2

1. a. June
   b. August
   c. 250
   d. 2000
2. a. 130
   b. second
   c. 30
   d. 410

3.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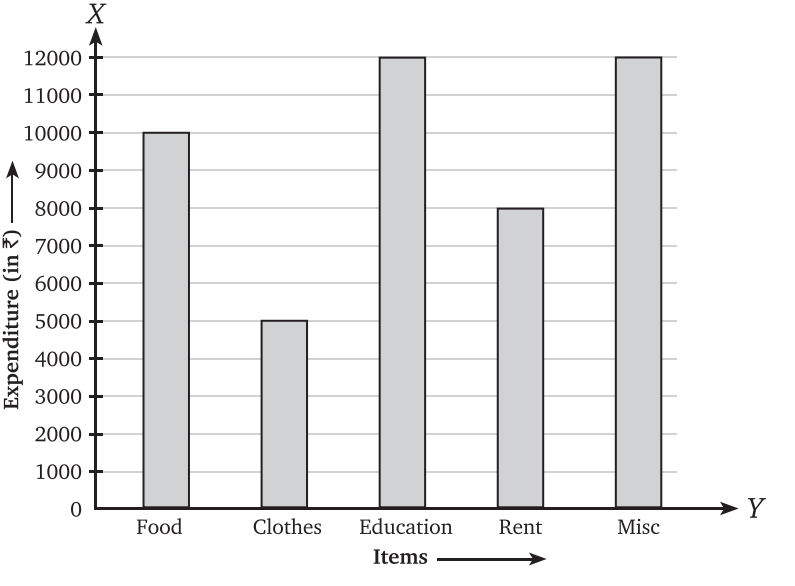
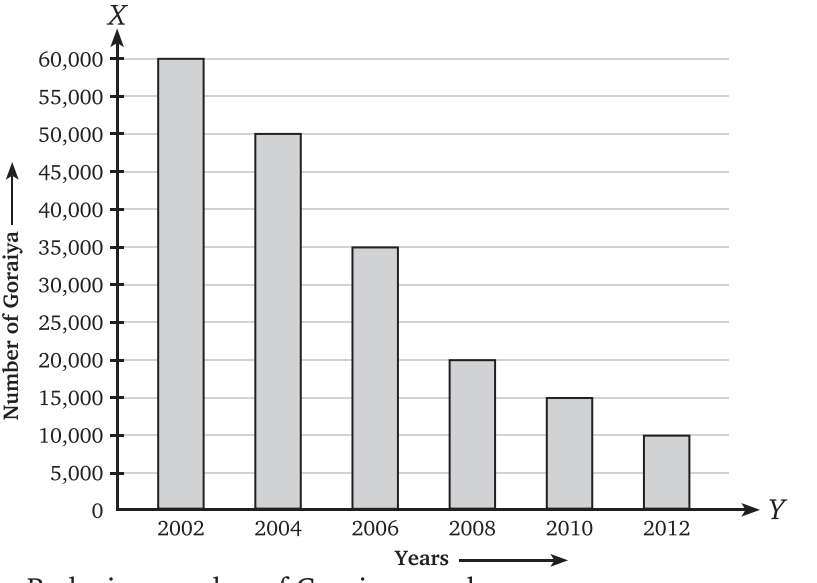
90,000
80,000
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
No. of Motorcycles
2019
2020
2021
2022
2023
2024
Years

4.


X
12000
11000
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
Expenditure (in ₹)
Y
Food
Clothes
Education
Rent
Misc
Items

5. a.



b. Reducing number of Goraiya year by year.

c. We should keep grains and water on rooftons on to save birds.

6. a. Newspapers of different languages.

b. Total newspapers = 2500 + 5000 + 3000 + 3250 + 2750 + 1000 + 2500 = 20000

c. Difference in English and Bengali = 5000 – 3250 = 1750

d. Required percentage $= \frac{5000}{20000} \times 100$

$= 25\%$

Revision Time

1.

Height	Tally Marks	Frequency
135	|	1
140	𝍸	5
144	|	1
145	|||	3
146	|	1
150	𝍸 𝍸	10

155	|||	3
160	𝍸	5
165	|	1
	Total	30

a. Students above 160 = 1

b. Students of minimum height = 1

2. Do yourself

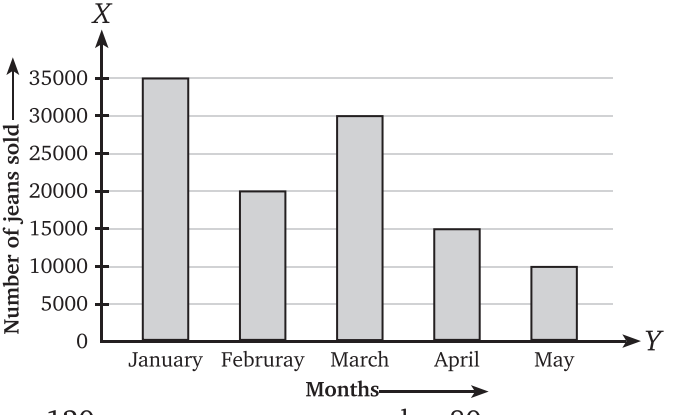
3. a. Deenu by $15 \times 20 = 300$

b. Rahim by $6 \times 20 = 120$

d. Difference between Honey and Rahim

$= (12 - 6) \times 20 = 6 \times 20 = 120$

4.



4. a. 120 b. 80

c. II and V d. 480

Mental Zone

1. When data is in the original form, it is called **raw data**.
2. An observation occurring as many times as in data is called its **frequency**.
3. The presentation of data with the help of pictures, is called **pictograph**.
4. In bar graph, length of bars **change**.

Multiple Choice Questions

Tick (✓) the correct opiton:

1. (b) 2. (b) 3. (c) 4. (a) 5. (c)

Case Study Based Questions

a. Rose

b. Flowers of Jasmine = $5 \times 10 = 50$

c. Flowers of Marigold = $8 \times 10 = 80$

d. Total number of flowers in garden

$= (10 + 8 + 5 + 9 + 6) \times 10$

$= 38 \times 10 = 380$

Chapter-5 : Prime Time

Assessment time 5.1

1. Fill in the blanks:

a. Every non-zero number is a factor of **itself**.

b. **1** is a factor of every number.

c. Every number is a multiple of **itself**.

d. There are **infinite** multiples of a number.

2. Write all the fractions of:

a. The factors of 30 are: 1, 2, 3, 5, 6, 10, 15, and 30.

b. The factors of 45 are: 1, 3, 5, 9, 15, and 45.

c. The factors of 85 are: 1, 5, 17, and 85.

d. The factors of 100 are: 1, 2, 4, 5, 10, 20, 25, and 100.

3. Determine whether:

a. When we divide 83 by 8, it is not completely divisible. So, 8 is not a factor of 83.

b. When we divide 108 by 9, we get: $108 \div 9 = 12$. Since this is an integer, 9 is a factor of 108.

c. When we divide 144 by 12, we get: $144 \div 12 = 12$. Since this is also an integer, 12 is a factor of 144.

d. When we divide 120 by 17, it is not completely divisible. So, 17 is not a factor of 120.

4. Write the first five multiples of:

a. Multiples of 7 are 7, 14, 21, 28, 35

b. Multiples of 12 are 12, 24, 36, 48, 60

c. Multiples of 15 are 15, 30, 45, 60, 75

d. Multiples of 23 are 23, 46, 69, 92, 115

5. Write:

a. The 4th multiple of $6 = 4 \times 6 = 24$

b. The 6th multiple of $9 = 6 \times 9 = 54$

c. The 8th multiple of $13 = 8 \times 13 = 104$

d. The 5th multiple of $15 = 5 \times 15 = 75$

6. Write:

a. The even multiples of 11 that are less than 150 can be calculated by identifying the first even multiple of 11, which is 22, and continuing in increments of 22 (2×11).

The resulting even multiples of 11 less than 150 are:

22, 44, 66, 88, 110, 132, and 144.

b. For the even multiples of 14 that are less than 180, we start with the first even multiple of 14, which is also 14 itself (2×7).

The even multiples of 14 less than 180 are:

14, 28, 42, 56, 70, 84, 98, 112, 126, 140 and 154.

c. The odd multiples of 17 that are less than 200 can be determined by starting with the first odd multiple of 17, which is simply the first multiple itself (17). The odd multiples of 17 under this limit include: 17, 51, 85 and 119.

d. Finally, for the odd multiples of 21 that are less than or equal to 200: starting with the first odd multiple (21), the sequence continues as follows: the odd multiples of 21 under this limit include: 21, 63, and 105.

7. Determine whether:

a. $13{,}962 \div 39$

We find that 13,962 divided by 39 equals 358 with a remainder of 0.

Yes, 13,962 is a multiple of 39.

b. $27{,}636 \div 42$

Dividing 27,636 by 42 gives us 658 with a remainder of 0.

Yes, 27,636 is a multiple of 42.

c. $36{,}033 \div 23$

The result of dividing 36,033 by 23 is approximately 1,566 with a remainder of 15. No, 36,033 is not a multiple of 23.

d. 34,639 ÷ 18

Dividing this number results in approximately 1,925 with a remainder of 11

No, 34,639 is not a multiple of 18.

8. Yes, it is possible for Rahul to obtain ₹ 900 in the form of ₹ 50 notes. To do this, he would need to calculate how many ₹ 50 notes are required to make up the total amount.

Number of notes $= \frac{900}{50} = 18$

Therefore, Rahul can achieve his goal by acquiring 18 ₹ 50 notes, which will sum up to exactly ₹ 900.

Critical Thinking Skills

65

Assessment time 5.2

1. Fill in the blanks :

a. **2** is the smallest prime number.

b. A number which has only two factors, is called a **prime numbers**.

c. The only one prime triplet is **3, 5, 7**.

d. Composite number has more than **two** factors.

2. Match the following:

a. (ii) b. (iii) c. (iv) d. (i)

3. a. Prime numbers between 15 and 54 are 17, 19, 23, 29, 31, 37, 41, 43, 47, 53

b. Prime numbers between 40 and 65 are 41, 43, 47, 53, 59, 61

c. Prime numbers between 66 and 80 are 67, 71, 73, 79

d. Prime numbers between 75 and 90 are 79, 83, 89

4. Which of the following numbers are prime?

b. 73 and c. 89 are prime

5. Express the following as the sum of two odd primes:

a. 13 + 19 b. 21 + 23

c. 41 + 43 d. 31 + 67

6. Express the following as the sum of three odd primes:

a. $35 = 5 + 13 + 17$ b. $49 = 7 + 19 + 23$

c. $63 = 3 + 29 + 31$ d. $61 = 11 + 19 + 31$

7. Choose even and odd from the following:

a. 64 c. 104 d. 96 (even)

b. 89 (odd)

8. All prime numbers except for 2 are odd due to the inherent properties of even numbers being divisible by 2, it is this very divisibility that excludes all other even integers from being classified as prime.

Assessment time 5.3

1. Write 'T' for true 'F' for false:

a. 72683 is divisible by 2. (F)

b. 96326 is not divisible by 3. (F)

c. A number divisible by 10 is always divisible by 5. (T)

d. A number divisible by 3 is always divisible by 9. (F)

2. Using divisibility test, which of the following numbers are divisible by 2 or 4?

a. $4208\boxed{6} \rightarrow$ 6 is even, so it is divisible by 2.

$420\boxed{86} \rightarrow$ 86 is not divisible by 4, So it is not divisible by 4.

b. $54396\boxed{3} \rightarrow$ 3 is odd, so it is not divisible by 2.

$5439\boxed{63} \rightarrow$ 63 is not divisible by 4, so it is not divisible by 4.

c. $8196\boxed{4} \rightarrow$ 4 is even, so it is divisible by 2.

$819\boxed{64} \rightarrow$ 64 is divisible by 4, so it is divisible by 4.

d. $91638\boxed{3} \rightarrow$ 3 is odd, so it is not divisible by 2.

$9163\boxed{63} \rightarrow$ 83 is not divisible by 4, so it is not divisible by 4.

3. Using divisibility test, which of the following numbers are divisible by 3 or 9?

a. 51363, Sum of digits $= 5 + 1 + 3 + 6 + 3 = 18$ Since 18 is divisible by both 3 and 9, so

51363 is divisible by both.

b. 816342, Sum of digits = 8 + 1 + 6 + 3 + 4 + 2 = 24 Since 24 is divisible by 3 but not by 9, so 816342 is divisible by 3 only.

c. 96348, Sum of digits = 9 + 6 + 3 + 4 + 8 = 30 Since 30 is divisible by 3 but not by 9, so 96348 is divisible by 3 only.

d. 379642, Sum of digits = 3 + 7 + 9 + 6 + 4 +2 = 31 Since 31 is not divisible by either, so 379642 is not divisible by either.

4. Using divisibility test, which of the following numbers are divisible by 6?

To determine if a number is divisible by 6, we need to check if it is divisible by both 2 and 3. For a number to be divisible by 2, its last digit must be even. For divisibility by 3, we sum up the digits of the number. If the sum is divisible by 3, then the entire number is divisible by 3.

a. 246328

Last digit is even (2) and sum of digits is 2 + 4 + 6 + 3 + 2 + 8 = 25, which is not divisible by 3. Therefore, 246328 is not divisible by 6.

b. 190632

Last digit is even (2) and sum of digits is 1 + 9 + 0 + 6 + 3 + 2 = 21, which is divisible by 3. Therefore, 190632 is divisible by 2 and 3, and thus divisible by 6.

c. 5462814

Last digit is even (4) and sum of digits is 5 + 4 + 6 + 2 + 8 + 1 + 4=30, which is divisible by 3. Therefore, 5462814 is divisible by 2 and 3, and thus divisible by 6.

d. 916326

Last digit is even (6) and sum of digits is 9 + 1 + 6 + 3 + 2 + 6 = 27, which is divisible by 3. Therefore, 916326 is divisible by 2 and 3, and thus divisible by 6.

5. Using divisibility test, which of the following numbers are divisible by 7?

To determine if a number is divisible by 7, we can use the divisibility rule for 7, which involves taking the last digit, doubling it, and subtracting it from the rest of the number. If the result is either 0 or a multiple of 7, then the number is

divisible by 7.

a. 6755 → Last digit: 5 Remaining number: 675
Calculation: 675 – (2 × 5) = 675 – 10 = 665
Repeat: Last digit of 665 is 5, remaining is 66.
Calculation: 66 – (2 × 5) = 66 – 10 = 56.
56 is divisible by 7.
So, 6755 is divisible by 7

b. 81634: → Last digit: 4 Remaining number: 8163
Calculation: 8163 – (2 × 4) = 8163 – 8 = 8155.
Repeat: Last digit of 8155 is 5, remaining is 815.
Calculation: 815 – (2 × 5) = 815 – 10 = 805.
Repeat again: Last digit of 805 is five, remaining is 80.
Calculation: 80 – 2 × 5 = 70, 70 is divisible by 7.
81634 is divisible by 7.

c. 405300 → Last digit:0 Remaining number : 40530
Calculation: 40530 – 0 = 40530, 4053 – 0 = 4053,
405 – 2 × 3 = 399, 39 – 2 × 9 = 21, 2 – 2 × 1 = 0.
Since 0 is divisible by 7.
So, 405300 is divisible by 7.

d. 519632 → Last digit: 2 Remaining number: 51963
Calculation: 51963 – 4 = 51959, 5195 – 2 × 9 = 5177,
517 – 14 = 503, 50 – 2 × 3 = 44.
Since 44 is not divisible by 7.
So, 519632 is not divisible by 7.

6. Using divisibility test, which of the following numbers are divisible by 5 or 10?

To determine which of the given numbers are divisible by 5 or 10, we can apply the divisibility tests for these two numbers:

Divisibility by 5: A number is divisible by 5 if its last digit is either 0 or 5.

Divisibility by 10: A number is divisible by 10 if its last digit is 0.

a. 723560: The last digit is 0, so it is divisible by both 5 and 10.

b. 51695: The last digit is 5, so it is divisible by 5 but not by 10.

c. 35815: The last digit is also 5, indicating it is divisible by 5 but not by 10.

d. 513720: The last digit here is 0, making it divisible by both 5 and 10.

SEL

To determine whether Tanya can donate the 603 clothes equally among 9 NGOs, we need to divide 603 by 9. Calculating this: 603 ÷ 9 = 67 with a remainder of 0. This means that Tanya can donate exactly 67 clothes to each of the 9 NGOs without any clothes left over. Therefore, she can indeed divide the clothes equally among the NGOs, and there will be no clothes remaining after the donation.

Critical Thinking Skills

1. $912x65 = 9 + 1 + 2 + x + 6 + 5 = 23 + x$

   $23 + x = 27$, So $x = 4$

2. 461x42,

   Sum of odd place digits $= 2 + x + 6 = 8 + x$

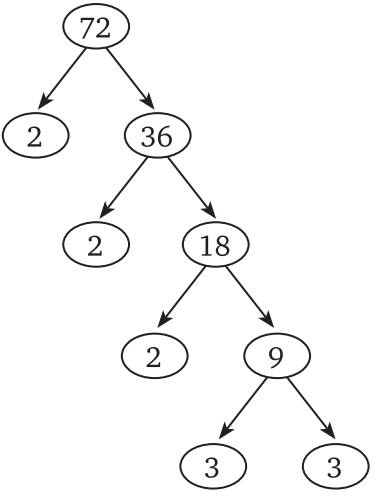
   Sum of even place digits $= 4 + 1 + 4 = 9$

   $8 + x = 9$, So $x = 1$

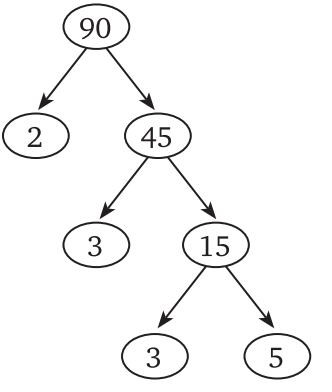
Assessment Time 5.4

1. Complete the following factor tree by filling the right number:

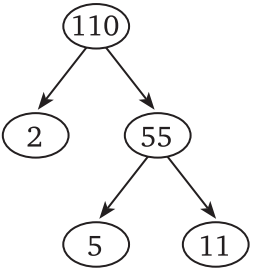
a. 72



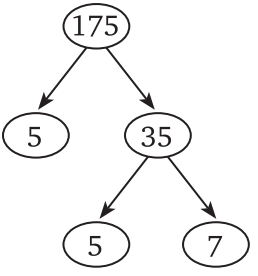
b. 90



c. 110

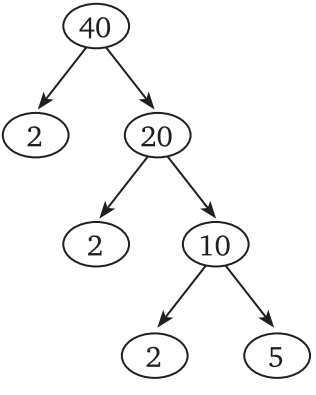


d. 175



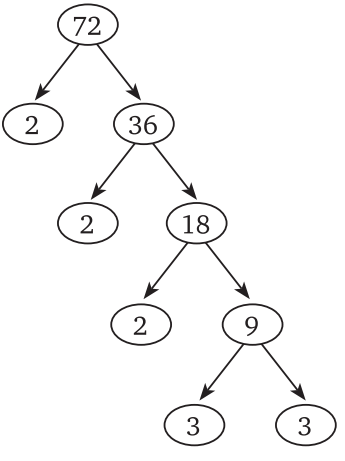
2. Find the prime factorisation of the following numbers by factor tree method:

a. 40



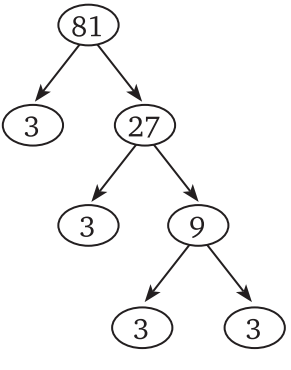
$\therefore 40 = 2 \times 2 \times 2 \times 5$

b. 72



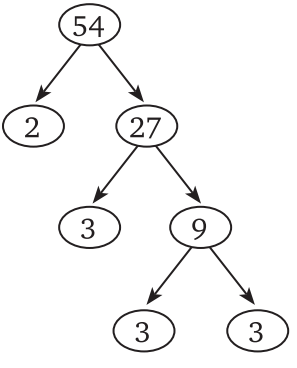
$\therefore 72 = 2 \times 2 \times 2 \times 3 \times 3$

c. 81



$\therefore 81 = 3 \times 3 \times 3 \times 3$

d. 54



$\therefore 54 = 2 \times 3 \times 3 \times 3$

3. Find the prime factorisation of the following numbers by division method :

a. 100

2	100
2	50
5	25
5	5
	1

$100 = 2 \times 2 \times 5 \times 5$

b. 130

2	130
5	65
13	13
	1

$130 = 2 \times 5 \times 13$

c. 225

3	225
3	75
5	25
5	5
	1

$225 = 3 \times 3 \times 5 \times 5$

d. 190

2	190
5	95
19	19
	1

$190 = 2 \times 5 \times 19$

4. Division Method,

$2880 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 5$

Subject Link

a. S b. A c. K d. C e. T

So, name is SAKET

Assessment Time 5.5

1. Fill up the following grids with prime numbers only so that the product of each row is the number to the right of the row and the product of each column is the number below the column:

a.

3	5	7	**105**
2	5	7	**70**
7	11	5	**385**
42	**275**	**245**	

b.

5	5	3	**75**
2	3	7	**42**
17	2	3	**102**
170	**30**	**63**	

c.

3	3	5	**45**
7	5	5	**175**
5	5	5	**125**
105	**75**	**125**	

d.

7	7	7	**343**
11	7	3	**231**
2	13	2	**52**
154	**637**	**42**	

e.

5	5	7	**175**
3	17	3	**153**
23	5	5	**575**
345	**425**	**105**	

f.

3	3	31	**279**
2	23	5	**230**
3	7	29	**609**
18	**483**	4495	

Revision Time

1. **Write all the factors of:**
   a. Factors of 15: 1, 3, 5, 15
   b. Factors of 35: 1, 5, 7, 35
   c. Factors of 80: 1, 2, 4, 5, 8, 10, 16, 20, 40, 80
   d. Factors of 95: 1, 5, 19, 95
2. **Write first five multiples of:**
   a. Multiples of 8: 8, 16, 24, 32, 40.
   b. Multiples of 13: 13, 26, 39, 52, 65.
   c. Multiples of 19: 19, 38, 57, 76, 95.
   d. Multiples of 22: 22, 44, 66, 88, 110.
3. **Write all the prime number between:**
   a. Prime numbers between 2 and 25: 2, 3, 5, 7, 11, 13, 17, 19, 23.
   b. Prime numbers between 40 and 65: 41, 43, 47, 53, 59, 61.
   c. Prime numbers between 90 and 99: 91 is not a prime number. So, there are no prime numbers between 90 and 99.
   d. Prime numbers between 10 and 20: 11, 13, 17, 19.
4. **Using divisibility test find which of the following numbers are divisible by 3 or 6 or 9?**

   To determine if a number is divisible by 3, 6, or 9, we must consider the divisibility rules for these numbers.

1. Divisibility by 3:

   A number is divisible by 3 if the sum of its digits is divisible by 3.

2. Divisibility by 6:

   A number is divisible by 6 if it is divisible by both 2 and 3. This means the number must be even and the sum of its digits must be divisible by 3.

3. Divisibility by 9:

   A number is divisible by 9 if the sum of its digits is divisible by 9.

Let's analyze the numbers given:

a. 2763: $2 + 7 + 6 + 3 = 18$ (divisible by 3)
   $\Rightarrow$ 2763 is divisible by 3 and 9.

b. 810954: $8 + 1 + 0 + 9 + 5 + 4 = 27$ (divisible by 3)
   $\Rightarrow$ 810954 is divisible by 3,6 and 9.

c. 96374: $9 + 6 + 3 + 7 + 4 = 29$ (not divisible by 3)
   $\Rightarrow$ 96374 is not divisible by 3.

d. 17136: $1 + 7 + 1 + 3 + 6 = 18$ (divisible by 3)
   $\Rightarrow$ 17136 is divisible by 3, 6 and 9.

5. Find the prime factorisation of the following by division method:

a. 512

2	512
2	256
2	128
2	64
2	32
2	16
2	8
2	4
2	2
	1

$\therefore 512 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2$

b. 729

3	729
3	243
3	81
3	27
3	9
3	3
	1

$\therefore 729 = 3 \times 3 \times 3 \times 3 \times 3 \times 3$

c. 1225

5	1225
5	245
7	49
7	7
	1

$\therefore 1225 = 5 \times 5 \times 7 \times 7$

d. 2025

3	2025
3	675
3	225
3	75
5	25
5	5
	1

$\therefore 2025 = 3 \times 3 \times 3 \times 3 \times 5 \times 5$

Mental Zone

1. The factors of a number are **finite**.
2. The second multiple of 13 is **26**.
3. The sixth multiple of 17 is **102**.

Write 'T' for true and 'F' for false :

4. The multiples of a number are finite. (F)
5. 8 is the factor of 102. (F)
5. 1 is the factor of every number (T)

Multiple Choice Questions

Tick (✓) the correct option:

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

Chapter-6: Perimeter and Area

Assessment Time 6.1

1. Find the perimeter of the following figures:

a. Perimeter $= AG + AB + BC + CD + DE + EF + FG$
$= 5 + 5 + 2 + 4 + 1 + 4 + 2$
$= 23$ cm

b. Perimeter $= PS + PQ + QR + RS$
$= 4 + 3.5 + 7 + 5.8$
$= 20.3$ cm

c. Perimeter $= AB + BC + CD + DA$
$= 3 + 6.5 + 7 + 6$
$= 22.5$ cm

d. Perimeter = 4 + 2 + 3 + 5 + 3 + 2 + 9 = 28 cm

e. Perimeter = 3+2+1+2+2+ 5 + 9 + 5 + 2 + 2 + 1 + 2
= 36 cm

f. Perimeter = $PQ + PR + QR$
= 3.5 + 7 + 8 = 18.5 cm

2. Fill in the blanks:

a. Perimeter of rectangle = $2\ (l + b)$
$= 2 \times (20 + 15)$
$= 2 \times 35 = 70$ cm

b. Perimeter of square = 4 × side
$= 4 \times 15 = 60$ cm

c. Perimeter of square = 80 cm
4 × side = 80 cm
$\text{side} = \frac{80}{4}\ \text{cm} = 20\ \text{cm}$

d. Perimeter of pentagon = 5 × side
$= 5 \times 6 = 30$ cm

e. Perimeter of hexagon = 6 × side
$= 6 \times 6.5 = 39$ cm

f. Perimeter of hexagon = 6 × side
72 = 6 × side
$\text{side} = \frac{72}{6}\ \text{cm} = 12\ \text{cm}$

3. Perimeter = 285 m + 268 m + 230 m = 783 m
Total cost = Perimeter × Cost per meter
Total cost = ₹ (783 × 4.85)
Total cost = ₹ 3797.55

Therefore, the cost of fencing the triangular field with wire at the rate of ₹ 4.85 per meter would be ₹ 3797.55.

4. Perimeter = 4 × side length
Perimeter = 4 × 285 meters = 1140 meters
Cost = Perimeter × Rate per meter
Cost = ₹ (1140 × 8.80) = ₹ 10,032

Therefore, the cost of fencing the square park with side length 285 meters at the rate of ₹ 8.80 per meter would be ₹ 10,032.

5. Length of the rectangular park = 155 m

   Breadth of the rectangular park = 138 m

   Perimeter of a rectangle = 2 × (Length + Breadth)

   Perimeter = 2 × (155 + 138)

   Perimeter = 2 × (293)

   Perimeter = 586 m

   Total distance covered in 8 rounds = Perimeter × 8

   Total distance covered in 8 rounds = 586 × 8

   Total distance covered in 8 rounds = 4688 m

   Therefore, the athlete covered a total distance of 4688 meters in 8 rounds around the rectangular park.

6. Given that the length and breadth of the lobby are in the ratio of 5 : 4, we can represent the dimensions as $5x$ and $4x$, where x is a common factor.

   First, let's calculate the perimeter of the lobby:

$$\begin{aligned} \text{Perimeter} &= 2(\text{length} + \text{breadth}) \\ 180 &= 2(5x + 4x) \\ 180 &= 2(9x) \\ 180 &= 18x \\ x &= 10 \end{aligned}$$

   Now that we have x, we can find the actual dimensions of the lobby:

   Length = $5x = 5 \times 10 = 50$ meters

   Breadth = $4x = 4 \times 10 = 40$ meters

   Therefore, the dimensions of the lobby are 50 meters in length and 40 meters in breadth.

7. Manya's distance around the square park = 4 × 95 = 380 m.

   Mahek's distance around the rectangular park = 2 × (110 + 75) = 370 meters.

   The difference in distance covered: 380 – 370 = 10 meters.

   Therefore, Manya covers 10 meters more than Mahek.

8. Cost of fencing the rectangular field at ₹ 5.50 per meter = ₹ 3300

   Breadth of the field = 120 meters

   Perimeter of a rectangle = 2(length + breadth)

We know that the cost of fencing the rectangle is ₹ 3300, which is equal to the perimeter of the rectangle multiplied by the cost per meter:

$$3300 = 2(x + 120) \times 5.50$$
$$3300 = 11(x + 120)$$
$$x + 120 = 300$$
$$x = 180$$

Therefore, the length of the rectangular field is 180 meters.

9. Let the side of the square garden be s.

Perimeter of the square = $4s = 4 \times 93 = 372$ m

Now, the total length of wire required to fence the square garden four times:

Total length of wire = 4 × Perimeter of the square garden

Total length of wire = 4 × 372 = 1488 m

The cost of wire at a rate of ₹ 12.25 per meter:

Cost of wire = Total length of wire x Rate per meter

Cost of wire = 1488 m × ₹ 12.25 per meter

Cost of wire = ₹ 18228

Therefore, the length of wire required to fence the square garden four times is 1488 meters, and the cost of wire at a rate of ₹ 12.25 per meter is ₹ 18228.

SDG–Good Health

10. P = 2 × (Length + Breadth)

P = 2 × (118 m + 76 m)

P = 2 × (194 m)

P = 388 m

Since Sanya takes 10 rounds of the park daily

Total Distance Covered = Perimeter × Number of Rounds

Total Distance Covered = 388 m × 10 = 3,880 m or 3.88 km

Values Depicted by Sanya: Sanya's commitment to following her doctor's advice demonstrates her dedication to improving her health. It shows that she values self-care and is proactive in taking steps to achieve her weight loss goals. Additionally, her consistency in walking every morning reflects discipline and determination.

Health Benefits of Morning Walks: Morning walks offer numerous health benefits, including:

1. **Weight Management:** Regular walking helps burn calories, aiding in weight loss and maintenance.
2. **Improved Cardiovascular Health:** Walking strengthens the heart and improves circulation, reducing the risk of heart disease.
3. **Enhanced Mood:** Physical activity releases endorphins, which can help reduce stress and improve overall mood.
4. **Boosted Energy Levels:** Morning walks can increase energy levels throughout the day by enhancing blood flow and oxygen supply to tissues.
5. **Better Sleep:** Engaging in regular physical activity can improve sleep quality and duration.

Critical thinking skills

Given: Perimeter of square park = Perimeter of rectangular park

Length of each side of square park = 60 m

Breadth of rectangular park = 45 m

Let's denote:

s = length of each side of the square park

l = length of the rectangular park

b = breadth of the rectangular park

Perimeter of square park = $4s$

Perimeter of rectangular park = $2(l + b)$

Given that both perimeters are equal:

$$4s = 2(l + b)$$

Substitute the values:

$$4(60) = 2(l+45)$$
$$240 = 2l + 90$$
$$2l = 240 - 90$$
$$2l = 150$$
$$l = 75$$

Therefore, the length of the rectangular park is 75 meters.

Assessment time 6.2

1. Find the area of the following figures with the help of grid paper:

a. No. of complete squares = 51
No. of more than half squares = 5
No. of half squares = 3
So, area of given figure = $(51 \times 1 + 5 \times 1 + 3 \times \frac{1}{2})$ sq unit
= 57.5 square unit

b. No. of complete squares = 25
No. of more than half squares = 5
No. of half squares = 4
So, area of given figure = $(25 \times 1 + 5 \times 1 + 4 \times \frac{1}{2})$ sq unit
= 32 square unit

c. No. of complete squares = 22
No. of more than half squares = 8
No. of half squares = 2
So, area of given figure = $(22 \times 1 + 8 \times 1 + 2 \times \frac{1}{2})$ sq unit
= 31 square unit

d. No. of complete squares = 4
No. of more than half squares = 15
So, area of given figure = $(4 \times 1 + 15 \times 1)$ sq unit
= 19 square unit

2. Area of rectangle = 18 cm × 13 cm = 234 cm^2
Therefore, the area of the rectangle with length 18 cm and breadth 13 cm is 234 cm^2.

3. Area = length × breadth
10308 m^2 = 120 m × breadth
$\text{Breadth} = \frac{10308\ m^2}{120\ m}$
Breadth = 85.9 m
Therefore, the breadth of the rectangular park is 85.9 meters.

4. Area of square ground = side × side

Area = 184 m × 184 m

Area = 33,856 square meters

Rate = ₹ 3 per square meter

Total Cost = Area x Rate

Total Cost = 33,856 sq m × ₹ 3/sq m

Total Cost = ₹ 101,568

Therefore, the cost of leveling a square ground with each side measuring 184 meters at the rate of ₹ 3 per square meter amounts to ₹ 101,568.

5. Area of rectangular park = Length x Breadth

Area = 225 m × 197 m

Area = 44325 m^2

Cost = Area × Cost per m^2

Cost = 44325 m^2 × ₹ 5.50/m^2

Cost = ₹ 243,787.50

Therefore, the total cost of grassing the rectangular park at the rate of ₹ 5.50 per m^2 would be ₹ 243,787.50.

6. Area of room = Length × Breadth

Area = 12.5 m × 8.5 m

Area = 106.25 m^2

Cost = Area × Rate

Cost = 106.25 m^2 × ₹ 65/m^2

Cost = ₹ 6906.25

Therefore, the cost of carpeting the room at the rate of ₹ 65 per m^2 would be ₹ 6,906.25.

7. Perimeter of the rectangular field:

Given length = 125 m, breadth = 103 m.

Perimeter of a rectangle = 2(length + breadth)

Perimeter = 2(125 + 103)

Perimeter = 2(228)

Perimeter = 456 m

Let the side of the square field be 'x' meters.

As it is given that the perimeter of both fields is the same, we set up an equation:

$4x = 456$ (perimeter of the rectangle)

$x = 114$

Area of the rectangular field:

Area = length × breadth

Area = 125 m × 103 m

Area = 12,875 sq. m

Area of the square field:

Side of the square (x) = 114 m

Area of a square = side × side

Area = 114 m × 114 m

Area = 12,996 sq. m

Area of the rectangular field = 12,875 sq. m

Area of the square field = 12,996 sq. m

Therefore, the square field has a greater area = 12,996 – 12,875 = 121 sq. m

Hence, the square field has a greater area by 121 square meters

8. Area of the verandah = Length × Breadth

= 15m × 12.5m

= 187.5 sq.m

Convert the tile dimensions to meters:

50 cm = 0.5 m

30 cm = 0.3 m

Area of 1 tile = Length × Breadth

= 0.5 m × 0.3 = 0.15 sq.m

$$\text{Number of Tiles} = \frac{\text{Total Area}}{\text{Tile Area}}$$

$$\text{Number of Tiles} = \frac{187.5 \text{ sq. m}}{0.15 \text{ sq. m}}$$

Number of Tiles = 1250

Total Cost = Number of Tiles × Cost per Tile

Total Cost = 1250 × ₹ 80

Total Cost = ₹ 100,000

Therefore, 1250 tiles are required to pave the verandah floor, and the total cost of the tiles would be ₹ 100,000 at the rate of ₹ 80 per tile.

9. Cost per square meter = ₹ 6.75

Total cost = ₹ 9450

$$\text{Area} = \frac{\text{Total cost}}{\text{Cost per square meter}}$$

$$\text{Area} = \frac{9450}{6.75}$$

Area = 1400 square meters

Since the field is rectangular, we have:

Area = Length × Breadth

1400 = Length × 35

$$\text{Length} = \frac{1400}{35}$$

Length = 40 meters

Perimeter = 2(Length + Breadth)

Perimeter = 2(40 + 35)

Perimeter = 2(75)

Perimeter = 150 meters

Therefore, the perimeter of the rectangular field is 150 meters.

10. Area = 15,000 sq m, Length = 150 m

$$\text{Width} = \frac{\text{Area}}{\text{Length}}$$

$$\text{Width} = \frac{15{,}000 \text{ sq m}}{150 \text{ m}} \quad 15{,}000 \text{ sq m} / 150 \text{ m}$$

Width = 100 m

Therefore, the width of the rectangular playground is 100 meters. On Republic Day, the students can plant trees around the playground to enhance the environment and promote sustainability.

Critical thinking skills

Length of the room = 8 m

Width of the room = 6.5 m

Side of the square carpet = 5.5 m

Area of the room = Length × Width

Area of the room = 8 m × 6.5 m

Area of the room = 52 m^2

Area of the carpet = Side × Side

Area of the carpet = 5.5 m × 5.5 m

Area of the carpet = 30.25 m^2

Area uncovered = Area of the room – Area of the carpet

Area uncovered = 52 m^2 – 30.25 m^2

Area uncovered = 21.75 m^2

Therefore, the area of the floor that is uncovered by the carpet is 21.75 square meters.

Revision time

1. Find the perimeter of the following figure:

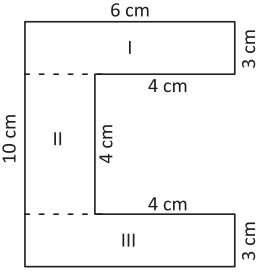
a. Perimeter of given figure = 5 + 7 + 2 + 4 + 3
= 21 cm

b. Perimeter of given figure = $AB + BC + CD + DE + EF + FG + GH + HI + IJ + JK + KL + LA$
= 3 + 2 + 2 + 2.5 + 2 + 4 + 3 + 4 + 2 + 2.5 + 2 + 2
= 31 cm

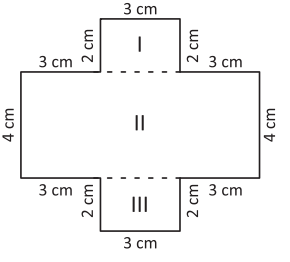
c. Perimeter of given figure = $AB + BC + CA$
= 5 + 6 + 7 = 18 cm

2. Find the area of the following figure:

a. Area of part-I = 6 × 3 = 18 cm^2
Area of part-II = 4 × 2 = 8 cm^2
Area of part-III = 6 × 3 = 18 cm^2
Total area = 18 + 8 + 18 = 44 cm^2



b. Area of part-I = 3 × 2 = 6 cm^2
Area of part-II = 4 × 9 = 36 cm^2
Area of part-III = 3 × 2 = 6 cm^2
Total area = 6 + 36 + 6 = 48 cm^2



3. Find the area of the following figures with the help of grid paper:

a. No. of full squares = 39

So, area of given figure = $39 \times 1 = 39$ unit^2

b. No. of full squares = 25

No. of more than half squares = 9

So, area of given figure = $(25 + 9) \times 1 = 34$ unit^2

4. Perimeter of regular hexagon = 6 × Side length

$= 6 \times 5.4$ cm $= 32.4$ cm

Therefore, the perimeter of a regular hexagon is 32.4 cm.

5. Perimeter = $285 \times 4 = 1140$ meters

Cost of fencing = Perimeter of the square × Cost per meter

Cost of fencing = ₹ (1140×8.50) = ₹ 9690

Therefore, the cost of fencing is ₹ 9690.

6. Perimeter = 2(length + breadth)

$360 = 2$(length + 85)

$180 =$ length + 85

Length = 95 m

Area = length × breadth

Area = 95 m × 85 m

Area = 8075 m^2

Cost of grassing = Area × Rate

Cost of grassing = 8075 m^2 × ₹ 3.85/m^2

= ₹ 31,088.75

Therefore, the length of the garden is 95 m and the cost of grassing is ₹ 31,088.75.

7. $$\text{Perimeter of square} = \frac{1872}{12} = 156$$

$$4 \times s = 156$$

$$s = \frac{156}{4}$$

$$s = 39$$

Therefore, each side of the square park is 39 meters long.

8. Area of rectangle = Length × Breadth.

2538 m^2 = 54 m × Breadth

Breadth = 2538 m^2 / 54 m

Breadth = 47 m

Perimeter of rectangle = 2(Length + Breadth).
= 2(54 m + 47 m)
= 2(101 m) = 202 m

Therefore, the breadth of the rectangle is 47 meters and the perimeter is 202 meters.

9. Cost of cultivating at ₹ 6.25 per sq m = $\frac{\text{Total cost}}{\text{Area of the field}}$

$₹\ 39312.50 = (L \times 74) \times 6.25$

$₹\ 39312.50 = 462.5 \times L$

$L = \frac{39312.50}{462.5}$

$L = 85$ meters

Perimeter = $2(L + B)$

Perimeter = $2(85 + 74)$

Perimeter = 2×159

Perimeter = 318 meters

Length of wire required = Perimeter of the field

Length of wire required = 318 meters

Therefore, the length of the rectangular field is 85 meters, and the length of wire required to fence it is 318 meters.

10. Reduced 4 times

Mental Zone

1. The perimeter of a square = 4 × side.
2. The area of a rectangle = **length × breadth**.
3. The perimeter of a square whose measure of each side is 5.4 cm is **21.6**.
4. The perimeter of a regular pentagon is 30 cm, then its side is **6 cm**.
5. The unit of perimeter is **same as unit of side**.
6. The unit of area is **unit²**.
7. The area of a rectangle is **96 cm²** if its length and breadth are 12 cm and 8 cm respectively.
8. The region enclosed by a plane figure is called **area**.
9. The length of boundary of a closed figure is called **perimeter**.
10. The length of a rectangular field whose area is 204 sq m and

breadth is 12 m, is **1 m**.

Multiple Choice Questions

Tick (✓) the correct option:

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

Case Study Based Questions

1. Area of land = $80 \times 65 = 5200$ m^2
2. Perimeter of plot = $2(l + b)$
   $= 2(80 + 65)$ m
   $= 2 \times 145 = 290$ m
3. Area needed to make house = $\frac{1}{2} \times 5200 = 2600$ m^2
4. Area needed to make garden = $\frac{3}{8} \times 5200 = 1950$ m^2
5. Area for parking = $500 - (2600 + 1950)$
   $= 650$ m^2

Chapter-7 : Fractions

Assessment Time 7.1

1. **Fill in the blanks:**
   a. The number above the horizontal line is called the **numerator**.
   b. The number below the horizontal line is called the **denominator**.
   c. In $\frac{5}{9}$, the numerator is **5**.
   d. $\frac{3}{7}$ of 21 balls is equal to **9** .
2. **Write the numerator and the denominator of each of the following:**
   a. $\frac{3}{17}$; numerator = 3, denominator = 17
   b. $\frac{5}{23}$; numerator = 5, denominator = 23
   c. $\frac{23}{29}$; numerator = 23, denominator = 29

d. $\frac{16}{33}$; numerator = 16, denominator = 33

3. Write the fraction whose:

a. Numerator = 12
Denominator = 17
Fraction = $\frac{12}{17}$

b. Numerator = 23
Denominator = 42
Fraction = $\frac{23}{42}$

c. Numerator = 2×3
Denominator = 5×6
Fraction = $\frac{6}{30}$

d. Numerator = 4×3
Denominator = 9×5
Fraction = $\frac{12}{45}$

4. Write the fraction representing the shaded portion:

a. $\frac{1}{2}$ b. $\frac{5}{8}$ c. $\frac{2}{3}$ d. $\frac{6}{16} = \frac{3}{8}$

5. Shade to show the given fraction: (Do yourself)

6. Draw the picture and find $\frac{1}{3}$ of a collection of: (Do yourself)

7. Draw the picture and find of a collection of: (Do yourself)

SEL-Sharing

8. He needs one more chocolate
Total chocolates = 25
Each is get chocolate = $\frac{25}{5} = 5$
Each will get, as fraction = $\frac{5}{25} = \frac{1}{5}$

Assessment Time 7.2

1. Fill in the missing numbers in the following equivalent fractions:

a. $\frac{2}{5} \times \frac{\boxed{x}}{20}$
On cross multiplication,
$\Rightarrow x \times 5 = 2 \times 20$
$\Rightarrow x = \frac{2 \times 20}{5}$
$\Rightarrow x = 8$

b. $\frac{7}{15} \times \frac{35}{\boxed{x}}$
$\Rightarrow 7 \times x = 35 \times 15$
$\Rightarrow x = \frac{35 \times 15}{7}$
$\Rightarrow x = 75$

c. $\frac{8}{15} \times \frac{\boxed{x}}{30}$

b. $\frac{\boxed{x}}{35} \times \frac{3}{5}$

On cross multiplication,

$\Rightarrow x \times 15 = 8 \times 30$ $\Rightarrow x \times 5 = 3 \times 35$

$\Rightarrow x = \frac{8 \times 30}{15}$ $\Rightarrow x = \frac{3 \times 35}{5}$

$\Rightarrow x = 16$ $\Rightarrow x = 21$

2. Write first five equivalent fractions to each of the following fractions:

a. Five equivalent fractions to $\frac{5}{11}$ are

$\frac{5\times2}{11\times2}, \frac{5\times3}{11\times3}, \frac{5\times4}{11\times4}, \frac{5\times5}{11\times5}, \frac{5\times6}{11\times6}$

$= \frac{10}{22}, \frac{15}{33}, \frac{20}{44}, \frac{25}{55}, \frac{30}{66}$

b. Five equivalent fractions to $\frac{7}{17}$ are

$\frac{7\times2}{17\times2}, \frac{7\times3}{17\times3}, \frac{7\times4}{17\times4}, \frac{7\times5}{17\times5}, \frac{7\times6}{17\times6}$

$= \frac{14}{34}, \frac{21}{51}, \frac{28}{68}, \frac{35}{85}, \frac{42}{102}$

c. Five equivalent fractions to $\frac{8}{19}$ are

$\frac{8\times2}{19\times2}, \frac{8\times3}{19\times3}, \frac{8\times4}{19\times4}, \frac{8\times5}{19\times5}, \frac{8\times6}{19\times6}$

$= \frac{16}{38}, \frac{24}{57}, \frac{32}{76}, \frac{40}{95}, \frac{48}{114}$

d. Five equivalent fractions to $\frac{11}{15}$ are

$\frac{11\times2}{15\times2}, \frac{11\times3}{15\times3}, \frac{11\times4}{15\times4}, \frac{11\times5}{15\times5}, \frac{11\times6}{15\times6}$

$= \frac{22}{30}, \frac{33}{45}, \frac{44}{60}, \frac{55}{75}, \frac{66}{90}$

3. Find the fraction equivalent to $\frac{5}{7}$ having:

a. Numerator = 20

In $\frac{5}{7}$, numerator is 5

So, we need such a number that can be multiplied by 5 to make it 20 (*i.e.* $20 \div 5 = 4$)

Now $\frac{5}{7} \times \frac{4}{4} = \frac{20}{28}$

b. Numerator = 30; In $\frac{5}{7}$, numerator is 5.
So, we need find such a number that can be multiplied by 5 to make it 30 (*i.e.* $30 \div 5 = 6$)
Now $\frac{5}{7} \times \frac{6}{6} = \frac{30}{42}$

c. Denominator = 77; In $\frac{5}{7}$, denominator is 7
So, we need find such a number that can be multiplied by 7 to make it 77 (*i.e.* $77 \div 7 = 11$)
Now $\frac{5}{7} \times \frac{11}{11} = \frac{55}{77}$

d. Denominator = 105 ; In $\frac{5}{7}$, denominator is 7
So, we need find such a number that can be multiplied by 7 to make it 105 (*i.e.* $105 \div 7 = 15$)
Now $\frac{5}{7} \times \frac{15}{15} = \frac{75}{105}$

4. Find the fraction equivalent to $\frac{64}{128}$ having:

a. Numerator = 16; In $\frac{64}{128}$, numerator is 64
So, we need find such a number that can be divided 64 to get 16 (i.e. $64 \div 16 = 4$)
So, $\frac{64}{128} = \frac{64 \div 4}{128 \div 4} = \frac{16}{32}$

b. Numerator = 32 ; In $\frac{64}{128}$, numerator is 64
So, we need find such a number that can be divided 64 to get 32 (i.e. $64 \div 32 = 2$)
So, $\frac{64}{128} = \frac{64 \div 2}{128 \div 2} = \frac{32}{64}$

c. Denominator = 16; In $\frac{64}{128}$, denominator is 128
So, we need find such a number that can be divided 128 to get 16 (i.e. $128 \div 16 = 8$)

So, $\frac{64}{128} = \frac{64 \div 8}{128 \div 8} = \frac{8}{16}$

d. Denominator = 32; In $\frac{64}{128}$, denominator is 128
So, we need find such a number that can be divided 128 to get 32 (i.e. $128 \div 32 = 4$)

So, $\frac{64}{128} = \frac{64 \div 4}{128 \div 4} = \frac{16}{32}$

5. Which of the following pairs are equivalent fractions?

a. $\frac{7}{18}$ and $\frac{21}{54}$

$\frac{7}{18} \times \frac{21}{54}$

On cross multiplication, we get

$7 \times 54 = 378$ and $21 \times 18 = 378$

Since, $7 \times 54 = 21 \times 18$

Hence, these are equivalent fraction

b. $\frac{5}{18}$ and $\frac{20}{72}$

$\frac{5}{18} \times \frac{20}{72}$

On cross multiplication, we get

$5 \times 72 = 360$ and $20 \times 18 = 360$

Since, $5 \times 72 = 20 \times 18$

Hence, these are equivalent fraction

c. $\frac{9}{11}$ and $\frac{27}{35}$

$\frac{9}{11} \times \frac{27}{35}$

On cross multiplication, we get

$9 \times 35 = 315$ and $27 \times 11 = 297$

Since, $7 \times 54 \neq 21 \times 18$

Hence, these are not equivalent fraction.

d. $\frac{8}{12}$ and $\frac{12}{21}$

$\frac{8}{12} \times \frac{12}{21}$

On cross multiplication, we get

$8 \times 21 = 168$ and $12 \times 12 = 144$

Since, $8 \times 21 \neq 12 \times 12$

Hence, these are not equivalent fraction.

6. Which of the following fractions are in their simplest form:

a. $\frac{13}{17}$ Since, HCF of 13 and 17 is 1,

So, they are in their simplest form.

b. $\frac{20}{32}$ Since, HCF of 20 and 32 is 4,

So, they are not in their simplest form.

c. $\frac{16}{25}$ Since, HCF of 16 and 25 is 1,

So, they are in their simplest form.

d. $\frac{28}{10}$ Since, HCF of 28 and 10 is 2,

So, they are not in their simplest form.

7. Reduce the following fractions in the simplest form:

a. $\frac{28}{10} = \frac{28 \div 5}{10 \div 5} = \frac{3}{5}$

b. $\frac{48}{72} = \frac{48 \div 24}{72 \div 24} = \frac{2}{3}$

c. $\frac{96}{120} = \frac{96 \div 24}{120 \div 24} = \frac{4}{5}$

d. $\frac{225}{650} = \frac{225 \div 25}{650 \div 25} = \frac{9}{26}$

Assessment Time 7.3

1. Write 'T' for true and 'F' for false:

a. Numerator of a proper fraction is greater than its denominator. (F)

b. All proper fractions have value less than 1. (T)

c. All improper fractions have value either 1 or greater than 1. (T)

d. Denominators of like fractions are different. (F)

2. Choose proper and improper fractions from the following:

a. $\frac{23}{20}$, Improper fraction, since numerator is greater than denominator.

b. $\frac{16}{33}$, Proper fraction, since numerator is less than denominator.

c. $\frac{28}{23}$, Improper fraction, since numerator is greater than denominator.

d. $\frac{91}{87}$, Improper fraction, since numerator is greater than denominator.

3. Convert the following improper fractions into mixed fractions:

a. $\frac{37}{8} = 4\frac{5}{8}$

$$\begin{array}{r} 4 \\ 8\overline{)37} \\ -32 \\ \hline 5 \end{array}$$

b. $\frac{43}{5} = 8\frac{3}{5}$

$$\begin{array}{r} 8 \\ 5\overline{)43} \\ -40 \\ \hline 3 \end{array}$$

c. $\frac{59}{6} = 9\frac{5}{6}$

$$\begin{array}{r} 9 \\ 6\overline{)59} \\ -54 \\ \hline 5 \end{array}$$

d. $\frac{81}{10} = 8\frac{1}{10}$

$$\begin{array}{r} 8 \\ 10\overline{)81} \\ -80 \\ \hline 1 \end{array}$$

4. Convert the following mixed fractions into improper fractions:

a. $2\frac{3}{4} = \frac{2 \times 4 + 3}{4} = \frac{11}{4}$

b. $6\frac{1}{9} = \frac{6 \times 9 + 1}{9} = \frac{55}{9}$

c. $8\frac{3}{5} = \frac{8 \times 5 + 3}{5} = \frac{43}{5}$

d. $4\frac{4}{7} = \frac{4 \times 7 + 4}{7} = \frac{32}{7}$

5. Compare the following pairs of fractions by making denominator equal:

a. $\frac{8}{12}$ and $\frac{10}{18}$

LCM of 12 and 18 is 36

$\therefore \frac{8}{12} = \frac{8 \times 3}{12 \times 3} = \frac{24}{36}$

or $\frac{10}{18} = \frac{10 \times 2}{18 \times 2} = \frac{20}{36}$

So, $\frac{24}{36} > \frac{20}{36}$

i.e. $\frac{8}{12} > \frac{10}{18}$

b. $\frac{6}{7}$ and $\frac{15}{18}$

LCM of 7 and 18 is 126

$\therefore \frac{6}{7} = \frac{6 \times 18}{7 \times 18} = \frac{108}{126}$

or $\frac{15}{18} = \frac{15 \times 7}{18 \times 7} = \frac{105}{126}$

So, $\frac{108}{126} > \frac{105}{126}$

i.e. $\frac{6}{7} > \frac{15}{18}$

c. $\frac{12}{17}$ and $\frac{18}{34}$

LCM of 17 and 34 is 34

$\therefore \frac{12}{17} = \frac{12 \times 2}{17 \times 2} = \frac{24}{34}$

or $\frac{18}{34} = \frac{18 \times 1}{34 \times 1} = \frac{18}{34}$

So, $\frac{24}{34} > \frac{18}{34}$

i.e. $\frac{12}{17} > \frac{18}{34}$

d. $\frac{19}{28}$ and $\frac{15}{21}$

LCM of 28 and 21 is 84

$\therefore \frac{19}{28} = \frac{19 \times 3}{28 \times 3} = \frac{57}{84}$

or $\frac{15}{21} = \frac{15 \times 4}{21 \times 4} = \frac{60}{84}$

So, $\frac{57}{84} < \frac{60}{84}$

i.e. $\frac{19}{28} < \frac{15}{21}$

6. Compare the following pairs of fractions by making numerator equal:

a. $\frac{10}{13}$ and $\frac{15}{18}$

LCM of 10 and 15 is 30

$\therefore \frac{10}{13} = \frac{10 \times 3}{13 \times 3} = \frac{30}{39}$

or $\frac{15}{18} = \frac{15 \times 2}{18 \times 2} = \frac{30}{36}$

So, $\frac{30}{39} < \frac{30}{36}$ $(\because \frac{1}{39} < \frac{1}{36})$

i.e. $\frac{10}{13} < \frac{15}{18}$

b. $\frac{7}{8}$ and $\frac{14}{15}$

LCM of 7 and 14 is 14

$\therefore \frac{7}{8} = \frac{7 \times 2}{8 \times 2} = \frac{14}{16}$

or $\frac{14}{15} = \frac{14 \times 1}{15 \times 1} = \frac{14}{15}$

So, $\frac{14}{16} < \frac{14}{15}$ $(\because \frac{1}{16} < \frac{1}{15})$

i.e. $\frac{7}{8} < \frac{14}{15}$

c. $\frac{16}{17}$ and $\frac{24}{33}$

LCM of 16 and 24 is 48

$\therefore \frac{16}{17} = \frac{16 \times 3}{17 \times 3} = \frac{48}{51}$

or $\frac{24}{33} = \frac{24 \times 2}{33 \times 2} = \frac{48}{66}$

So, $\frac{48}{51} > \frac{48}{66}$ $(\because \frac{1}{51} > \frac{1}{66})$

i.e. $\frac{16}{17} > \frac{24}{33}$

d. $\frac{11}{15}$ and $\frac{33}{40}$

LCM of 11 and 33 is 33

$\therefore \frac{11}{15} = \frac{11 \times 3}{15 \times 3} = \frac{33}{45}$

or $\frac{33}{40} = \frac{33 \times 1}{40 \times 1} = \frac{33}{40}$

So, $\frac{33}{45} < \frac{33}{40}$ $(\because \frac{1}{45} < \frac{1}{40})$

i.e. $\frac{11}{15} < \frac{33}{45}$

7. Compare the following pairs of fractions by cross multiplication method:

a. $\frac{3}{10}$ and $\frac{7}{15}$

$\frac{3}{10}$ ✕ $\frac{7}{15}$

On cross multiplication, we get

$15 \times 3 = 45$

and $7 \times 10 = 70$

Since $45 < 70$

Hence, $\frac{3}{10} < \frac{7}{15}$

b. $\frac{18}{19}$ and $\frac{15}{30}$

$\frac{18}{19}$ ✕ $\frac{15}{30}$

$18 \times 30 = 540$

and $19 \times 15 = 285$

Since $540 > 285$

Hence, $\frac{18}{19} > \frac{15}{30}$

a. $\frac{7}{18}$ and $\frac{12}{25}$

$\frac{7}{18}$ ✕ $\frac{12}{25}$

On cross multiplication, we get

$7 \times 25 = 175$

and $18 \times 12 = 216$

Since $175 < 216$

Hence, $\frac{7}{18} < \frac{12}{25}$

b. $\frac{9}{14}$ and $\frac{5}{19}$

$\frac{9}{14}$ ✕ $\frac{5}{19}$

$9 \times 19 = 171$

and $14 \times 5 = 70$

Since $171 > 70$

Hence, $\frac{9}{14} > \frac{5}{19}$

8. Arrange the following fractions in ascending order:

a. $\frac{6}{17}, \frac{11}{34}, \frac{15}{51}, \frac{25}{68}$

First we have to convert unlike fraction into like fractions.

LCM of 17, 34, 51 and 68 is 204

Now, $\frac{6}{17} = \frac{6 \times 12}{17 \times 12} = \frac{72}{204}$ $\frac{11}{34} = \frac{11 \times 6}{34 \times 6} = \frac{66}{204}$

$\frac{15}{51} = \frac{15 \times 4}{51 \times 4} = \frac{60}{204}$ $\frac{25}{68} = \frac{25 \times 3}{68 \times 3} = \frac{75}{204}$

Since, $60 < 66 < 72 < 75$

So, the ascending order $\frac{15}{51}, \frac{11}{34}, \frac{6}{17}, \frac{25}{68}$

b. $\frac{9}{11}, \frac{3}{22}, \frac{11}{33}, \frac{8}{44}$

First we have to convert unlike fraction into like fractions.

LCM of 11, 22, 33 and 44 is 132

Now, $\frac{9}{11} = \frac{9 \times 12}{11 \times 12} = \frac{108}{132}$ $\frac{3}{22} = \frac{3 \times 6}{22 \times 6} = \frac{18}{132}$

$\frac{11}{33} = \frac{11 \times 4}{33 \times 4} = \frac{44}{132}$ $\frac{8}{44} = \frac{8 \times 3}{44 \times 3} = \frac{24}{132}$

Since, $18 < 24 < 44 < 108$

So, the ascending order $\frac{3}{22}, \frac{8}{44}, \frac{11}{33}, \frac{9}{11}$

c. $\frac{3}{5}, \frac{7}{15}, \frac{9}{20}, \frac{3}{10}$

First we have to convert unlike fraction into like fractions.

LCM of 5, 15, 20 and 10 is 60

Now, $\frac{3}{5} = \frac{3 \times 12}{5 \times 12} = \frac{36}{60}$ $\frac{7}{15} = \frac{7 \times 4}{15 \times 4} = \frac{28}{60}$

$\frac{9}{20} = \frac{9 \times 3}{20 \times 3} = \frac{27}{60}$ $\frac{3}{10} = \frac{3 \times 6}{10 \times 6} = \frac{18}{60}$

Since, $18 < 27 < 28 < 32$

So, the ascending order $\frac{3}{10}, \frac{9}{20}, \frac{7}{15}, \frac{3}{5}$

d. $\frac{5}{14}, \frac{9}{21}, \frac{18}{35}, \frac{15}{28}$

First we have to convert unlike fraction into like fractions.

LCM of 14, 21, 35 and 25 is 420

Now, $\frac{5}{14} = \frac{5 \times 30}{14 \times 30} = \frac{150}{420}$ $\frac{9}{21} = \frac{9 \times 20}{21 \times 20} = \frac{180}{420}$

$\frac{18}{35} = \frac{18 \times 12}{35 \times 12} = \frac{216}{420}$ $\frac{15}{28} = \frac{15 \times 15}{28 \times 15} = \frac{225}{420}$

Since, $\frac{150}{420} < \frac{180}{420} < \frac{216}{420} < \frac{225}{420}$

So, the ascending order $\frac{5}{14}, \frac{9}{21}, \frac{18}{35}, \frac{15}{28}$

9. Arrange the following fractions in descending order:

a. $\frac{8}{15}, \frac{7}{30}, \frac{1}{6}, \frac{4}{5}$

First we have to convert unlike fraction into like fractions.

LCM of 15, 30, 6 and 5 is 30

Now, $\frac{8}{15} = \frac{8 \times 2}{15 \times 2} = \frac{16}{30}$ $\frac{7}{30} = \frac{7 \times 1}{30 \times 1} = \frac{7}{30}$

$\frac{1}{6} = \frac{1 \times 5}{6 \times 5} = \frac{5}{30}$ $\frac{4}{5} = \frac{4 \times 6}{5 \times 6} = \frac{24}{30}$

Since, $\frac{24}{30} > \frac{16}{30} > \frac{7}{30} > \frac{5}{30}$

So, the descending order $\frac{4}{5}, \frac{8}{15}, \frac{7}{30}, \frac{5}{30}$

b. $\frac{3}{4}, \frac{7}{8}, \frac{11}{16}, \frac{23}{40}$

First we have to convert unlike fraction into like fractions.

LCM of 4, 8, 16 and 40 is 80

Now, $\frac{3}{4} = \frac{3 \times 20}{4 \times 20} = \frac{60}{80}$ $\frac{7}{8} = \frac{7 \times 10}{8 \times 10} = \frac{70}{80}$

$\frac{11}{16} = \frac{11 \times 5}{16 \times 5} = \frac{55}{80}$ $\frac{23}{40} = \frac{23 \times 2}{40 \times 2} = \frac{46}{80}$

Since, $\frac{70}{80} > \frac{60}{80} > \frac{55}{80} > \frac{46}{80}$

So, the descending order $\frac{7}{8}, \frac{3}{4}, \frac{11}{16}, \frac{23}{40}$

c. $\frac{5}{7}, \frac{9}{14}, \frac{19}{28}, \frac{17}{21}$

First we have to convert unlike fraction into like fractions.

LCM of 7, 14, 28 and 21 is 84

Now, $\frac{5}{7} = \frac{5 \times 12}{7 \times 12} = \frac{60}{84}$ $\frac{9}{14} = \frac{9 \times 6}{14 \times 6} = \frac{54}{84}$

$\frac{19}{28} = \frac{19 \times 3}{28 \times 3} = \frac{57}{84}$ $\frac{17}{21} = \frac{17 \times 4}{21 \times 4} = \frac{68}{84}$

Since, $\frac{68}{84} > \frac{60}{84} > \frac{57}{84} > \frac{54}{84}$

So, the descending order $\frac{17}{21}, \frac{5}{7}, \frac{19}{28}, \frac{9}{14}$

d. $\frac{7}{9}, \frac{6}{24}, \frac{5}{12}, \frac{3}{15}$

First we have to convert unlike fraction into like fractions.

LCM of 9, 24, 12 and 15 is 360

Now, $\frac{7}{9} = \frac{7 \times 40}{9 \times 40} = \frac{280}{360}$ $\frac{6}{24} = \frac{6 \times 15}{24 \times 15} = \frac{90}{360}$

$\frac{5}{12} = \frac{5 \times 30}{12 \times 30} = \frac{150}{360}$ $\frac{3}{15} = \frac{3 \times 24}{15 \times 24} = \frac{72}{360}$

Since, $\frac{280}{360} > \frac{150}{360} > \frac{90}{360} > \frac{72}{360}$

So, the descending order $\frac{7}{9}, \frac{5}{12}, \frac{6}{24}, \frac{3}{15}$

SDG—Zero Hunger

Rohit denotes milk $= 12\frac{1}{2}$ L $= \frac{25}{2}$ L

His friend donate milk $= 12\frac{1}{3}$ L $= \frac{37}{3}$ L

On equalising the denominator,

$\frac{25}{2} \times \frac{3}{3} = \frac{75}{6}$ or $\frac{37}{3} \times \frac{2}{2} = \frac{74}{6}$

$\because \frac{75}{6} > \frac{74}{6}$ $(75 > 74)$

So, Rohit donates more milk.

Critical Thinking Skill

1. Rajan covered journey $= \frac{2}{5}$

Mukesh covered journey $= \frac{5}{6}$

Rohit covered journey $= \frac{3}{4}$

First we convert the unlike fraction into like fraction.

LCM of 5, 6 and 4 is 60

$\frac{2}{5} \times \frac{12}{12} = \frac{24}{60}$, $\frac{5}{6} \times \frac{10}{10} = \frac{50}{60}$, $\frac{3}{4} \times \frac{15}{15} = \frac{45}{60}$

$\frac{24}{60} < \frac{45}{60} < \frac{50}{60}$

Hence, the ascending order is $\frac{2}{5}$, $\frac{3}{4}$ and $\frac{5}{6}$

2. Mayank answered questions $= \frac{11}{20}$

Pinky answered question $= \frac{2}{5}$

On equalising the denominator we get

$\frac{11}{20} \times \frac{1}{1} = \frac{11}{20}$ $\frac{2}{5} \times \frac{4}{4} = \frac{8}{20}$

$\frac{11}{20} > \frac{8}{20}$

Mayank answered more questions. So he get more score.

Assessment Time 7.4

1. Add the following:

a. $\frac{3}{14} + \frac{5}{14} = \frac{3+5}{14} = \frac{8}{14} = \frac{4}{7}$

b. $\frac{6}{23} + \frac{7}{23} = \frac{6+7}{23} = \frac{13}{23}$

c. $\frac{10}{19} + \frac{3}{19} = \frac{10+3}{19} = \frac{13}{19}$

d. $\frac{4}{37} + \frac{11}{37} = \frac{4+11}{37} = \frac{15}{37}$

2. Add the following:

a. $\frac{3}{7} + \frac{5}{21} = \frac{3 \times 3 + 5}{21} = \frac{9+5}{21} = \frac{14}{21} = \frac{2}{3}$

b. $\frac{6}{7} + \frac{9}{28} + 3 = \frac{6 \times 4 + 9 \times 1 + 3 \times 28}{28}$

$= \frac{24 + 9 + 84}{28}$

$= \frac{117}{28} = 4\frac{5}{28}$

c. $2 + \frac{3}{10} + \frac{7}{20} = \frac{2 \times 20 + 3 \times 2 + 7 \times 1}{20}$

$= \frac{40 + 6 + 7}{20}$

$= \frac{53}{20} = 2\frac{13}{20}$

d. $2\frac{1}{7} + 1\frac{1}{14} + 3 = \frac{15}{7} + \frac{15}{14} + 3$

$= \frac{15 \times 2 + 15 \times 1 + 3 \times 14}{14}$

$= \frac{30 + 15 + 42}{14}$

$= \frac{87}{14} = 6\frac{3}{14}$

3. Subtract the following:

a. $\frac{6}{15} - \frac{3}{15} = \frac{6-3}{15} = \frac{3}{15} = \frac{1}{5}$

b. $\frac{12}{13} - \frac{11}{13} = \frac{12-11}{13} = \frac{1}{13}$

c. $\frac{16}{33} - \frac{8}{33} = \frac{16-8}{33} = \frac{8}{33}$

d. $\frac{9}{17} - \frac{3}{17} = \frac{9-3}{17} = \frac{6}{17}$

4. Subtract the following:

a. $\frac{7}{13} - \frac{6}{26} = \frac{7 \times 2 - 6 \times 1}{26} = \frac{14-6}{26} = \frac{8}{26} = \frac{4}{13}$

b. $\frac{11}{18} - \frac{3}{22} = \frac{11 \times 11 - 3 \times 9}{198} = \frac{121-27}{198} = \frac{94}{198} = \frac{47}{99}$

c. $4 - 3\frac{1}{12} = 4 - \frac{37}{12} = \frac{4 \times 12 - 37 \times 1}{12}$

$= \frac{48-37}{12} = \frac{11}{12}$

d. $2\frac{3}{4} - 1\frac{1}{8} = \frac{11}{4} - \frac{9}{8} = \frac{4 \times 12 - 37 \times 1}{12}$

$= \frac{11 \times 2 - 9 \times 1}{8}$

$= \frac{22-9}{8} = \frac{13}{8} = 1\frac{5}{8}$

5. Simplify the following:

a. $7\frac{2}{5} - 3\frac{2}{15} + 1\frac{7}{10} = \frac{37}{5} - \frac{47}{15} + \frac{17}{10}$

$= \frac{37 \times 6 - 47 \times 2 + 17 \times 3}{30}$

$= \frac{222 - 94 + 51}{30} = \frac{273 - 94}{30}$

$= \frac{179}{30} = 5\frac{29}{30}$

b. $12 - 3 + 4\frac{1}{5} = 12 - \frac{7}{2} + \frac{21}{5}$

$= \frac{12 \times 10 - 7 \times 5 + 21 \times 2}{10}$

$= \frac{120 - 35 + 42}{10} = \frac{162 - 35}{10}$

$= \frac{127}{10} = 12\frac{7}{10}$

c. $7\frac{2}{5} - 3\frac{1}{12} + 3\frac{7}{10} = \frac{37}{5} - \frac{37}{12} + \frac{37}{10}$

$= \frac{37 \times 12 - 37 \times 5 + 37 \times 6}{60}$

$= \frac{444 - 185 + 222}{60} = \frac{481}{60}$

$= 8\frac{1}{60}$

d. $6\frac{3}{6} + 2\frac{1}{12} - 3\frac{7}{24} = \frac{39}{6} + \frac{25}{12} - \frac{79}{24}$

$= \frac{39 \times 4 + 25 \times 2 + 79 \times 1}{24}$

$= \frac{156 + 50 - 79}{24} = \frac{206 - 79}{24}$

$= \frac{127}{24} = 5\frac{7}{24}$

6. Fill in the boxes:

a. $\square - \frac{3}{5} = \frac{1}{5}$

$\square = \frac{1}{5} + \frac{3}{5}$

$\square = \frac{1+3}{5} = \frac{4}{5}$

b. $\frac{1}{2} - \square = \frac{1}{6}$

$\square = \frac{1}{2} - \frac{1}{6}$

$\square = \frac{3-1}{6} = \frac{2}{6} = \frac{1}{3}$

So, $\boxed{\frac{4}{5}} - \frac{3}{5} = \frac{1}{5}$

So, $\frac{1}{2} - \boxed{\frac{1}{3}} = \frac{1}{6}$

c. $\frac{13}{14} - \square = \frac{5}{21}$

$\square = \frac{13}{14} - \frac{5}{21}$

$\square = \frac{13 \times 3 - 5 \times 2}{42}$

$\square = \frac{39 - 10}{42} = \frac{29}{42}$

d. $\frac{2}{15} - \square = \frac{1}{10}$

$\square = \frac{2}{15} - \frac{1}{10}$

$\square = \frac{2 \times 2 - 1 \times 3}{30}$

$\square = \frac{4 - 3}{30} = \frac{1}{30}$

7. Required Number $= 18\frac{3}{7} - 15$

$= \frac{18 \times 7 + 3}{7} - 15 = \frac{126 + 3}{7} - 15$

$= \frac{129 - 105}{7} = \frac{24}{7} = 3\frac{3}{7}$

8. Cost of two pens $= ₹\ 25\frac{2}{5} = ₹\ \frac{127}{5}$

Cost of a school bag $= ₹\ 52\frac{1}{4} = ₹\ \frac{209}{4}$

Total money she spent $= ₹\ \frac{127}{5} + \frac{209}{4}$

$= ₹\ \frac{127 \times 4 + 209 \times 5}{20}$

$= ₹\ \frac{508 + 1045}{20} = ₹\ \frac{1553}{20}$

$= ₹\ 77\frac{13}{20}$

9. Ranjan took petrol in car $= 25$ L

Petrol used $= 12\frac{1}{4}$ L $= \frac{12 \times 4 + 1}{4}$ L $= \frac{49}{4}$ L

Petrol left in the car $= 25 - \frac{49}{4} = \frac{100 - 49}{4}$

$= \frac{51}{4} = 12\frac{3}{4}$ L

SEL-Helping

10. Weight of three bags $= 25\frac{1}{5}$ kg, $15\frac{4}{10}$ kg and $40\frac{1}{4}$ kg

$= \frac{25 \times 5 + 1}{5} + \frac{14 \times 10 + 4}{10} + \frac{40 \times 4 + 1}{4}$

$$= \frac{126}{5} + \frac{144}{10} + \frac{161}{4}$$

$$= \frac{126 \times 4 + 144 \times 2 + 161 \times 5}{20}$$

$$= \frac{504 + 288 + 805}{20} = \frac{1597}{20} \text{ kg}$$

Critical Thinking Skills

1. Total weight of fruits = 20 kg

$$\text{Weight of apples} = 5\frac{1}{10} \text{ kg} = \frac{51}{10} \text{ kg}$$

$$\text{Weight of mangoes} = 8\frac{3}{8} \text{ kg} = \frac{67}{8} \text{ kg}$$

$$\text{Weight of oranges} = 20 - \left(\frac{51}{10} + \frac{67}{8}\right)$$

$$= \frac{40 \times 20 - 51 \times 4 - 67 \times 5}{40}$$

$$= \frac{800 - 204 - 335}{40} = \frac{800 - 539}{40}$$

$$= \frac{261}{40} = 6\frac{21}{40}$$

2. $$\text{Rohan takes time} = 3\frac{1}{7} \text{ minutes}$$

$$\text{Vijay takes time} = 3\frac{1}{7} + \frac{40}{60} = \frac{3 \times 7 + 1}{7} + \frac{40}{60}$$

$$= \frac{22}{7} + \frac{2}{3} = \frac{66 + 14}{21}$$

$$= \frac{80}{21} = 3\frac{17}{21}$$

Revision Time

1. Write the fraction representing the shaded portion:

a. $\frac{5}{8}$ b. $\frac{7}{20}$ c. $\frac{2}{5}$ d. $\frac{1}{4}$

2. Write first five equivalent fractions to each of the following fractions:

a. $\frac{3}{7} \times \frac{2}{2} = \frac{6}{14}$ $\frac{3}{7} \times \frac{3}{3} = \frac{9}{21}$ $\frac{3}{7} \times \frac{4}{4} = \frac{12}{28}$

$\frac{3}{7} \times \frac{5}{5} = \frac{15}{35}$ $\frac{3}{7} \times \frac{6}{6} = \frac{18}{42}$

Hence, five equivalent fraction are $\frac{6}{14}, \frac{9}{21}, \frac{12}{28}, \frac{15}{35}$ and $\frac{18}{42}$

b. $\frac{5}{9} \times \frac{2}{2} = \frac{10}{18}$ $\frac{5}{9} \times \frac{3}{3} = \frac{15}{27}$ $\frac{5}{9} \times \frac{4}{4} = \frac{20}{36}$

$\frac{5}{9} \times \frac{5}{5} = \frac{25}{45}$ $\frac{5}{9} \times \frac{6}{6} = \frac{30}{54}$

Hence, five equivalent fraction are $\frac{10}{18}, \frac{15}{27}, \frac{20}{36}, \frac{25}{45}$ and $\frac{30}{54}$

c. $\frac{11}{13} \times \frac{2}{2} = \frac{22}{26}$ $\frac{11}{13} \times \frac{3}{3} = \frac{33}{39}$ $\frac{11}{13} \times \frac{4}{4} = \frac{44}{52}$

$\frac{11}{13} \times \frac{5}{5} = \frac{55}{65}$ $\frac{11}{13} \times \frac{6}{6} = \frac{66}{78}$

Hence, five equivalent fraction are $\frac{22}{26}, \frac{33}{39}, \frac{44}{52}, \frac{55}{65}$ and $\frac{66}{78}$

d. $\frac{17}{20} \times \frac{2}{2} = \frac{34}{40}$ $\frac{17}{20} \times \frac{3}{3} = \frac{51}{60}$ $\frac{17}{20} \times \frac{4}{4} = \frac{68}{80}$

$\frac{17}{20} \times \frac{5}{5} = \frac{85}{100}$ $\frac{17}{20} \times \frac{6}{6} = \frac{102}{120}$

Hence, five equivalent fraction are $\frac{34}{40}, \frac{51}{60}, \frac{68}{80}, \frac{85}{100}$ and $\frac{102}{120}$.

3. Find the missing numbers in the following equivalent fractions:

a. $\frac{17}{20} = \frac{\boxed{x}}{30}$

$x = \frac{7 \times 30}{10}$

$= 7 \times 3 = 21$

b. $\frac{13}{25} = \frac{39}{\boxed{x}}$

$x = \frac{25 \times 39}{13}$

$= 25 \times 3 = 75$

c. $\frac{8}{15} = \frac{\boxed{x}}{45}$

$x = \frac{45 \times 8}{15}$

$= 3 \times 8 = 24$

b. $\frac{27}{30} = \frac{\boxed{x}}{60}$

$x = \frac{60 \times 27}{30}$

$= 2 \times 27 = 54$

4. Which of the following pairs are equivalent fractions?

a. $\frac{8}{15}$ and $\frac{24}{45}$

$\frac{8}{15} \times \frac{24}{45}$

On cross multiplication, we get

$8 \times 45 = 360$ and $15 \times 24 = 360$

Since, $8 \times 45 = 15 \times 24$

Hence, $\frac{8}{15}$ and $\frac{24}{45}$ are equivalent fraction.

b. $\frac{7}{11}$ and $\frac{21}{44}$

$\frac{7}{11} \times \frac{21}{44}$

On cross multiplication, we get

$7 \times 44 = 308$ and $21 \times 11 = 132$

Since, $7 \times 44 \neq 21 \times 11$

Hence, $\frac{7}{11}$ and $\frac{21}{44}$ are not equivalent fraction.

c. $\frac{5}{13}$ and $\frac{40}{104}$

$\frac{5}{13} \times \frac{40}{104}$

On cross multiplication, we get

$5 \times 104 = 520$ and $40 \times 13 = 520$

Since, $5 \times 104 = 40 \times 13$

Hence, $\frac{5}{13}$ and $\frac{40}{104}$ are equivalent fraction.

d. $\frac{6}{13}$ and $\frac{30}{65}$

$\frac{6}{13} \times \frac{30}{65}$

On cross multiplication, we get

$6 \times 65 = 390$ and $13 \times 30 = 390$

Since, $6 \times 65 = 13 \times 30$

Hence, $\frac{6}{13}$ and $\frac{30}{65}$ are equivalent fraction.

5. Reduce the following fractions in the simplest form:

a. $\frac{35}{80}$

HCF of 35 and 80 is 5.

b. $\frac{81}{135}$

HCF of 81 and 135 is 27.

$\frac{35}{80} = \frac{35 \div 5}{80 \div 5} = \frac{7}{16}$

$\frac{81}{135} = \frac{81 \div 27}{135 \div 27} = \frac{3}{5}$

c. $\frac{140}{220}$

HCF of 140 and 220 is 20.

$\frac{140}{220} = \frac{140 \div 20}{220 \div 20} = \frac{7}{11}$

d. $\frac{78}{260}$

HCF of 78 and 260 is 26.

$\frac{78}{260} = \frac{78 \div 26}{260 \div 26} = \frac{3}{10}$

6. Compare the following pairs of fractions:

a. $\frac{3}{13}$ and $\frac{8}{15}$

$\frac{3}{13} \times \frac{8}{15}$

On cross multiplication, we get

$3 \times 15 = 45$

and $13 \times 8 = 104$

Since $45 < 104$

Hence, $\frac{3}{13} < \frac{8}{15}$

b. $\frac{9}{17}$ and $\frac{8}{24}$

$\frac{9}{17} \times \frac{8}{25}$

$9 \times 25 = 225$

and $17 \times 8 = 136$

Since $225 > 135$

Hence, $\frac{9}{17} > \frac{8}{24}$

c. $\frac{5}{16}$ and $\frac{3}{12}$

$\frac{5}{16} \times \frac{3}{12}$

On cross multiplication, we get

$5 \times 12 = 60$

and $16 \times 3 = 48$

Since $60 > 48$

Hence, $\frac{5}{16} > \frac{3}{12}$

d. $\frac{18}{23}$ and $\frac{54}{60}$

$\frac{18}{23} \times \frac{54}{60}$

$18 \times 60 = 1080$

and $23 \times 54 = 1242$

Since $1080 < 1242$

Hence, $\frac{18}{23} < \frac{54}{60}$

7. Arrange the following fractions in ascending order:

a. $\frac{5}{13}, \frac{41}{65}, \frac{9}{26}$ and $\frac{15}{52}$

First we have to convert unlike fraction into like fractions.

LCM of 13, 65, 26 and 52 is 260

Now, $\frac{5}{13} = \frac{5 \times 20}{13 \times 20} = \frac{100}{260}$ $\frac{41}{65} = \frac{41 \times 4}{65 \times 4} = \frac{84}{260}$

$$\frac{9}{26} = \frac{9 \times 10}{26 \times 10} = \frac{90}{260} \quad \frac{15}{52} = \frac{15 \times 5}{52 \times 5} = \frac{75}{260}$$

Since, $\frac{75}{260} < \frac{84}{260} < \frac{90}{260} < \frac{100}{260}$

So, the ascending order $\frac{15}{52}, \frac{41}{65}, \frac{9}{26}, \frac{5}{13}$

b. $\frac{7}{10}, \frac{9}{25}, \frac{6}{20}$ and $\frac{11}{15}$

First we have to convert unlike fraction into like fractions.

LCM of 10, 25, 20 and 15 is 300

Now, $\frac{7}{10} = \frac{7 \times 30}{10 \times 30} = \frac{210}{300} \quad \frac{9}{25} = \frac{9 \times 12}{25 \times 12} = \frac{108}{300}$

$$\frac{6}{20} = \frac{6 \times 15}{20 \times 15} = \frac{90}{300} \quad \frac{11}{15} = \frac{11 \times 20}{15 \times 20} = \frac{220}{300}$$

Since, $\frac{90}{300} < \frac{108}{300} < \frac{210}{300} < \frac{220}{300}$

So, the ascending order $\frac{6}{20}, \frac{9}{25}, \frac{7}{10}, \frac{11}{15}$

8. Arrange the following fractions in descending order:

a. $\frac{3}{4}, \frac{7}{8}, \frac{5}{12}$ and $\frac{8}{20}$

First we have to convert unlike fraction into like fractions.

LCM of 4, 8, 12 and 20 is 120

Now, $\frac{3}{4} = \frac{3 \times 30}{4 \times 30} = \frac{90}{120} \quad \frac{7}{8} = \frac{7 \times 15}{8 \times 15} = \frac{105}{120}$

$$\frac{5}{12} = \frac{5 \times 10}{12 \times 10} = \frac{50}{120} \quad \frac{8}{20} = \frac{8 \times 6}{20 \times 6} = \frac{48}{120}$$

Since, $\frac{105}{120} > \frac{90}{120} > \frac{50}{120} > \frac{48}{120}$

So, the descending order $\frac{7}{8}, \frac{3}{4}, \frac{5}{12}, \frac{8}{20}$

b. $\frac{9}{14}, \frac{5}{21}, \frac{4}{28}$ and $\frac{11}{35}$

First we have to convert unlike fraction into like fractions.

LCM of 14, 21, 28 and 35 is 420

Now, $\frac{9}{14} = \frac{9 \times 30}{14 \times 30} = \frac{270}{420} \quad \frac{5}{21} = \frac{5 \times 20}{21 \times 20} = \frac{100}{420}$

$$\frac{4}{28} = \frac{4 \times 15}{28 \times 15} = \frac{60}{420} \quad \frac{11}{35} = \frac{11 \times 12}{35 \times 12} = \frac{132}{420}$$

Since, $\frac{270}{420} > \frac{132}{420} > \frac{100}{420} > \frac{60}{420}$

So, the descending order $\frac{9}{14}, \frac{11}{35}, \frac{5}{21}, \frac{4}{28}$

9. Add the following:

a. $\frac{5}{18} + \frac{7}{12} = \frac{5 \times 2 + 7 \times 3}{36} = \frac{10 + 21}{36} = \frac{31}{36}$

b. $\frac{3}{4} + \frac{7}{18} + \frac{9}{16} = \frac{3 \times 36 + 7 \times 8 + 9 \times 9}{144}$

$= \frac{108 + 56 + 81}{144} = \frac{245}{144} = 1\frac{101}{144}$

c. $3\frac{2}{7} + 2\frac{5}{14} = \frac{7 \times 3 + 2}{7} + \frac{14 \times 2 + 5}{14}$

$= \frac{23}{7} + \frac{33}{14} = \frac{23 \times 2 + 33 \times 1}{14}$

$= \frac{46 + 33}{14} = \frac{79}{14} = 5\frac{9}{14}$

d. $2\frac{2}{9} + 1\frac{1}{4} + 3\frac{5}{12} = \frac{9 \times 2 + 2}{9} + \frac{1 \times 4 + 1}{4} + \frac{12 \times 3 + 5}{12}$

$= \frac{20}{9} + \frac{5}{4} + \frac{41}{2}$

$= \frac{80 + 45 + 123}{36} = \frac{248}{36}$

$= \frac{62}{9} = 6\frac{8}{9}$

10. Subtract the following:

a. $7 - \frac{3}{8} = \frac{7 \times 8 - 3 \times 1}{8} = \frac{56 - 3}{8} = \frac{53}{8}$

b. $\frac{5}{16} - \frac{7}{32} = \frac{5 \times 2 - 7 \times 1}{32} = \frac{10 - 7}{32} = \frac{3}{32}$

c. $2\frac{3}{13} - 1\frac{5}{26} = \frac{13 \times 2 + 3}{13} - \frac{26 \times 1 + 5}{26}$

$= \frac{29}{13} - \frac{31}{26}$

$= \frac{29 \times 2 - 31 \times 1}{26} = \frac{58 - 31}{26}$

$$= \frac{27}{26} = 1\frac{1}{26}$$

d. $3 - 2\frac{1}{16} = 3 - \frac{16 \times 2 + 1}{26}$

$$= 3 - \frac{33}{16}$$

$$= \frac{3 \times 16 - 33}{16} = \frac{48 - 33}{16} = \frac{15}{16}$$

11. Simplify:

a. $6\frac{1}{3} + 2\frac{5}{6} - 3\frac{2}{12} = \frac{19}{3} + \frac{17}{6} - \frac{38}{12}$

$$= \frac{19 \times 4 + 17 \times 2 - 38 \times 1}{12}$$

$$= \frac{76 + 34 - 38}{12} = \frac{110 - 38}{12}$$

$$= \frac{72}{12} = 6$$

b. $2 - 2\frac{1}{4} + 5\frac{3}{6} = 2 - \frac{9}{4} + \frac{33}{6}$

$$= \frac{2 \times 12 - 9 \times 3 + 33 \times 2}{12}$$

$$= \frac{24 - 27 + 66}{12} = \frac{90 - 27}{12}$$

$$= \frac{63}{12} = \frac{21}{4} = 5\frac{1}{4}$$

12. Required Number $= 3\frac{1}{7} - 2\frac{1}{14}$

$$= \frac{22}{7} - \frac{29}{14}$$

$$= \frac{22 \times 2 - 29 \times 1}{7}$$

$$= \frac{44 - 29}{14} = \frac{15}{14} = 1\frac{1}{14}$$

Hence, the required number is $1\frac{1}{14}$.

13. Shaksham ate apples in morning $= \frac{1}{5}$

Shaksham ate apples in evening $= \frac{3}{4}$

Total apples he ate $= \frac{1}{5} + \frac{3}{4}$

$$= \frac{1}{5} + \frac{3}{4} = \frac{4 + 15}{20} \text{ apples}$$
$$= \frac{19}{20}$$

He ate $\frac{19}{20}$ apples.

14. Total quantity of milk = 2 L

Manisha used milk = $1\frac{1}{3}$ L

Milk remained = $2 \text{ L} - 1\frac{1}{3}$ L

$$= 2 - \frac{3 \times 1 + 1}{3} \text{ L} = 2 - \frac{4}{3} \text{ L}$$
$$= \frac{2 \times 3 - 4}{3} \text{ L} = \frac{6 - 4}{3} \text{ L} = \frac{2}{3} \text{ L}$$

Hence, $\frac{2}{3}$ L of milk is remained.

15. Weight of empty cylinder = $15\frac{2}{5}$ kg = $\frac{77}{5}$ kg

Weight of gas = $14\frac{1}{5}$ kg = $\frac{71}{5}$ kg

Weight of gas filled cylinder = $\frac{77}{5} + \frac{71}{5}$ kg

$$= \frac{77 + 71}{5} = \frac{148}{5} \text{ kg}$$
$$= 29\frac{3}{5} \text{ kg}$$

Mental Zone

1. The number below the horizontal line is called **denominator**.
2. In words $\frac{5}{11}$ is written as **five eleventh**.
3. In $\frac{8}{23}$, numerator is **8**.
4. The HCF of numerator and denominator of a lowest fraction is **1** .
5. Fractions having same denominator are called **like fractions** .
6. All proper fractions have value **less than 1**.
7. Unit fraction having smaller denominators is **greater** than other with larger denominator.
8. $\frac{5}{8}$ is **greater** than $\frac{3}{7}$.

9. Improper fraction of $4\frac{1}{7}$ is $\frac{29}{7}$.

10. Mixed fraction of $\frac{22}{5}$ is $4\frac{2}{5}$.

Multiple Choice Questions

Tick (✓) the correct option

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

Chapter-8: Playing with Constructions

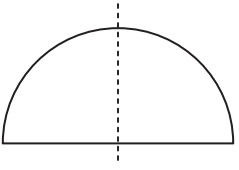
(Do yourself)

Chapter-9 : Symmetry

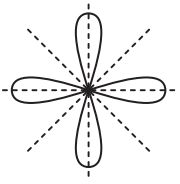
Assessment Time 9.1

1. Draw the lines of symmetry in the following figures:

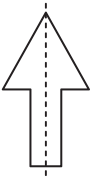
a.



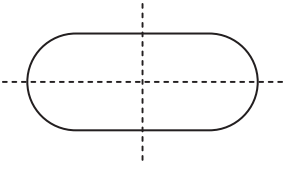
b.



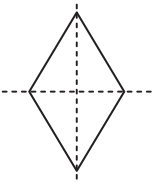
c.



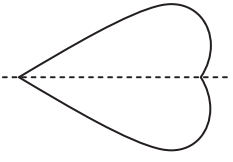
d.



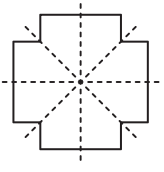
e.



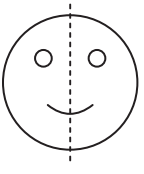
f.



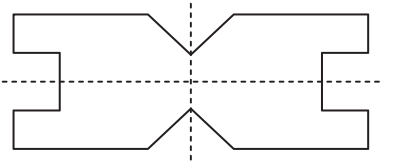
g.



h.

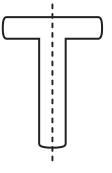


i.



2. Draw the lines of symmetry in the following English alphabets if possible:

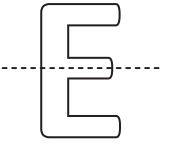
a.



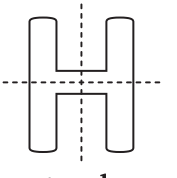
b.

c.

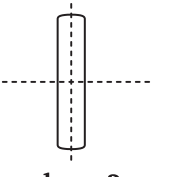
d.



e.



f.



3. How many lines of symmetry does each figure have?

a. 1 b. 2 c. 5 d. no (0)

4. Is the dotted line, line of symmetry?

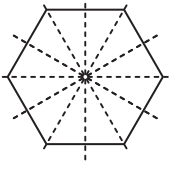
a. no b. yes c. no d. yes

5. Draw the line of symmetry. Write how many these are.

a. no b. yes (1) c. no d. yes (1)

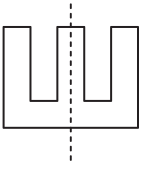
6. Draw the line of symmetry. Write how many these are.

a.



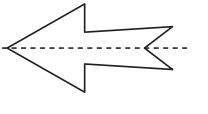
6 (six)

b.



1 (one)

c.



1 (one)

7. Match the following:

a. (iv) b. (v) c. (ii)
d. (i) e. (iii)

8. Do yourself

Critical Thinking Skills (Do yourself)

Assessment Time 9.2

Do yourself

Assessment Time 9.3

1. Fill in the blanks:

a. The order of rotational symmetry in an equilateral triangle is **three**.

b. The order of rotational symmetry in a square is **four**.

c. The angle of rotation of rotational symmetry in a rhombus is **180°**.

d. The angle of rotation of rotational symmetry in an equilateral triangle is **120°**.

2, 3, 4, 5 (Do yourself)

Revision Time

1. Write 'T' for true and 'F' for false:

a. A square has two lines of symmetry. (F)

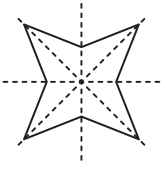
b. A regular hexagon has six lines of symmetry. (T)

c. A rhombus has four lines of symmetry. (F)

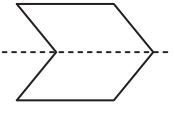
d. An isosceles triangle has one line of symmetry. (T)

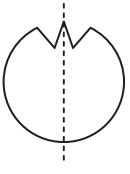
2. Draw the lines of symmetry in the following figures:

a. 

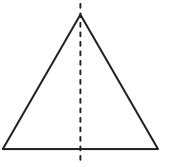
b. 

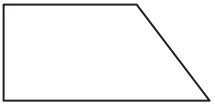
c. 

d. 

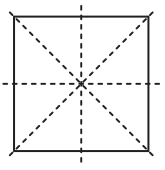
e. 

f. 

g. 

h. 

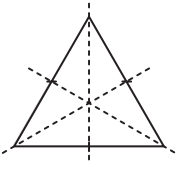
No

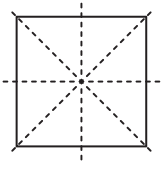
i. 

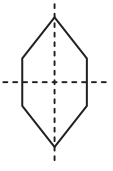
3. Which of the following are symmetrical about the dotted lines?

a. no b. yes c. yes
d. no e. yes f. yes

4. Draw the lines of symmetry in the following geometrical shapes:

a. 

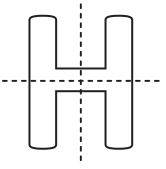
b. 

c. 

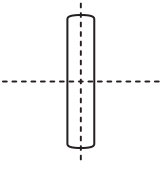
5. Draw the mirror image of the following: (Do yourself)

6. Draw the lines of symmetry in the following English alphabet if possible:

a.  (no lines)

b. 

c. 

d. 

7. Draw figures of four objects from your surroundings which are symmetrical. (Do yourself)

8. What do you mean by symmetry? (Do yourself)

Mental Zone

1. A line segment is symmetrical about its **perpendicular bisector**.
2. A rhombus has **two** lines of symmetry.
3. A regular pentagon has **five** lines of symmetry.

4. A circle has **infinite** lines of symmetry.
5. **Isosceles Triangle** has only one line of Symmetry.
6. **Circle** has many lines of Symmetry.
7. A rhombus has **two** lines of symmetry.
8. A regular hexagon has **six** lines of symmetry.
9. A rectangle has rotational symmetry of order **two**.
10. The letter H has rotational symmetry of order **two**.

Multiple Choice Questions

Tick (✓) the correct options:

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

Case Study Based Questions (Do yourself)

Chapter-10: The Other Side of Zero (Integers)

Assessment Time 10.1

1. Write 'T' for true and 'F' for false:

a. Rise in price is denoted by +ve sign. (T)
b. Every negative integer is always greater than 0. (F)
c. Every positive integer is greater than every negative integer. (T)
d. The absolute value of an integer is always greater than the integer. (F)

2. Represent each of the following statement with an appropriate integer:

a. Loss of ₹ 790 = – ₹ 790
b. Win by 4 runs = + 4
c. 39°C below 0°C = – 39°C
d. Deposit of ₹ 1800 = + ₹ 1800
e. 36 km below sea level = – 36 km
f. After 26 years = + 26 years

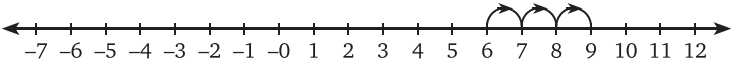
3. Write the opposite of the following:

a. Loss of ₹ 150.
b. Going east 34 km.
c. fall ₹ 40 in cost.
d. Gaining weight.

4. Using number line, write the integer which is:

a. 3 more than 6.

We will start from 6 and move 3 steps forward.

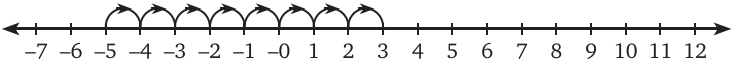


We reach at 9.

So, 3 more than 6 is 9.

b. 8 more than – 5.

We will start from – 5 and move 8 steps forward

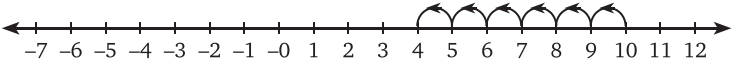


We reach at 3

So, 8 more than – 5 is 3.

c. 6 less than 10.

We will start from 10 and move 6 steps backward.

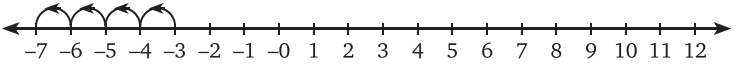


We reach at 4.

So, 6 less than 10 is 4.

d. 4 less than – 3.

We will start from – 3 and move 4 steps backward

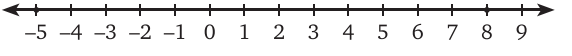


We reach at –7

So, 4 less than –3 is –7

5. Using number line, fill in the blanks with '>' or '<':

a. – 5 ____ 8

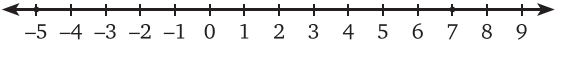


According to the number line. 8 comes on the right side and –5 comes on the left side.

So, –5 < 8

b. 7 ____ – 5

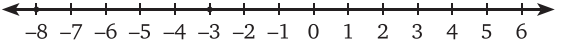
According to the number line +8 is come on the right side and –5 is come on the left side.



$7 > -5$

c. $-8 \_\_\_\_ -3$

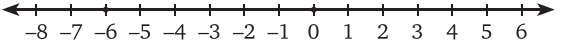
According to the number line, we get



So, $-8 < -3$

d. $0 \_\_\_\_ -6$

According to the number line we get



So, $0 > -6$

6. Which one of the following is greater in the following pairs of integers?

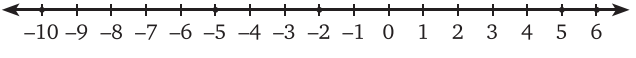
a. $-15 > -26$ b. $853 > -963$

c. $0 > -15$ d. $-160 < 1$

7. Using number line, write the following numbers in ascending order:

a. $-5, -10, -2, 5, 6$

First, we will draw the number line and mark the given integer on the number line.

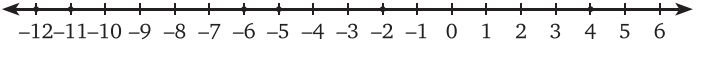


It is clear from number line $-10 < -5 < -2 < 5 < 6$

Hence, the ascending order is –10, –5, –2, 5 and 6

b. $-11, -12, -6, -5, 4$

First we will draw the number line and mark the given integer on the number line.

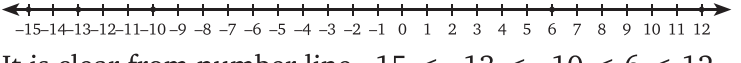


It is clear from number line. $-12 < -11 < -6 < -5 < 4$

Hence, the ascending order is –12, –11, –6, –5, 4

c. $12, -13, -15, 6, -6$

First we will draw the number line and mark the given integer on the number.

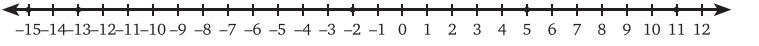


It is clear from number line $-15 < -13 < -10 < 6 < 12$

Hence, the ascending order is –15, –13, –10, 6 and 12

d. – 13, – 15, 11, 5, – 2

First we will draw the number line and mark the given integer on the number line.



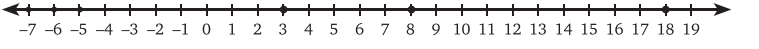
Is is clear from number line –15 < –13 < –2, < 5 < 11.

Hence, ascending order is –15, –13, –2, 5 and 11

8. Using number line, write the following numbers in descending order:

a. 8, – 5, 3, – 7, 18, – 6

First we will draw the number line and mark the given integer on the number line.

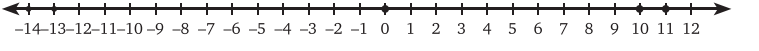


Is is clear from number line 18 > 8 > 3 > –5 > –6 > –7

Hence, descending order is 18, 8, 3, –6, –5 and –1

b. – 14, 10, 11, – 13, 0

First we will draw the number line and mark the given integer on the number line.

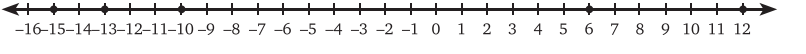


Is is clear from number line 11 > 10 > 0 > –13 > –14

Hence, descending order is 11, 10, 0, –13 and –14

c. – 10, – 15, 6, 12, – 13

First we will draw the number line and mark the given integer on the number line.

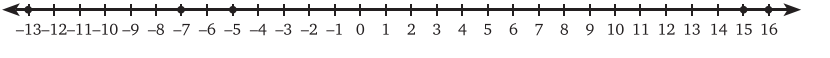


Is is clear from number line 12 > 6 > –10 > –13 > –15

Hence, descending order is 12, 6, –10, –13 and –15

d. – 5, – 13, 16, 15, – 7

First we will draw the number line and mark the given integer on the number line.



Is is clear from number line 16 > 15 > –5 > –7 > –13

Hence, descending order is 16, 15, –5, –7, –13

9. Evaluate the following:

a. $|26| - |-15| + |32|$
$= 26 - 15 + 32 = 58 - 15 = 43$

b. $|-16 - 12| - |18 + 3|$
$= |-28| - |21| = 28 - 21 = 7$

c. $|-135| - |112 - 67|$
$= |-135| - |45| = 135 - 45 = 90$

d. $|47 - 32| - |16 - 42|$
$= |15| - |-26| = 15 - 26 = -11$

Assessment Time 10.2

1. Fill in the blanks with '>', '<' or '=':

a. $(-7) + (-8)$ ..... $(-15) - (-3)$.
$= -7 - 8$ ..... $-15 + 3$
$= -15$ ..... -12
$= -15 < -12$

b. $13 - (-26)$ ..... $15 - (-20)$
$13 + 26$ ..... $15 + 20$
$39 > 35$

c. $(-63) + (-23)$ ..... $(-17) - (-17)$.
$-63 - 23$ ..... $-17 + 17$
$-86 < 0$

d. $-15 + 18$ ..... $-16 + (-12)$.
$-15 + 18$ ..... $-16 - 12$
$3 > -28$

2. Write 'T' for true and 'F' for false:

a. The sum of an integer and its negative is zero. (T)

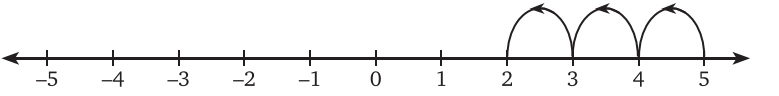
b. The sum of two negative integers is always a negative integer. (T)

c. The additive inverse of 5 is . (T)

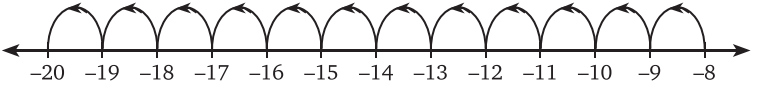
d. Subtraction is commutative under integers. (F)

3. Add the following integers on number line:

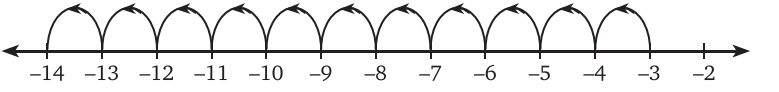
a. $5 + (-3) = 5 - 3 = \mathbf{2}$



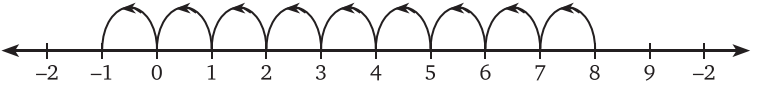
b. $(-12) + (-8) = -12 - 8 = \mathbf{-20}$



c. $(-3) + (-4) + (-7) = -3 - 4 - 7 = \mathbf{-14}$



d. $8 + (-3) + (-6) = 8 - 3 - 6 = 8 - 9 = \mathbf{-1}$



4. Add the following without using number line:

a. $(-128) + 634 = -125 + 634 = \mathbf{506}$

b. $(-205) + (-416) = -205 - 416 = \mathbf{-621}$

c. $(-37) + (-67) + (102) = -37 - 67 + 102$

$= -104 + 102 = \mathbf{-2}$

d. $(-15) + (-87) + (-25) = -15 - 87 - 25$

$= \mathbf{-127}$

5. Simplify the following:

a. $816 + (-913) + (-614) + 218$

$= 816 + 218 - 913 - 614$

$= 1034 - 1527 = \mathbf{-493}$

b. $(-602) + (-416) + 371 + (-124)$

$= -602 - 416 - 124 + 371$

$= -1142 + 371 = \mathbf{-771}$

c. $(-243) + 62 - (-91) + 423 + (-7)$

$= -243 + 62 + 91 + 423 - 7$

$= 576 - 250 = 326$

d. $(-412) - (-128) + (-617) - 2034$

$= 412 - 617 - 203 + 128$

$= 3063 + 128 = \mathbf{-2935}$

6. Write the additive inverse of the following:

a. Additive inverse of – 761 is 761

b. Additive inverse of 317 is – 317

c. Additive inverse of– 819 is 819

d. Additive inverse of – 6023 is 6023

7. Find an integer '*y*' such that:

a. $y + 4 = 0$
$y = 0 - 4$
$\boldsymbol{y = -4}$

b. $y - 18 = 0$
$y = 0 + 18$
$\boldsymbol{y = 18}$

c. $14 + y = 0$
$y = 0 - 14$
$\underline{\boldsymbol{y}} = -14$

d. $y - 13 + \ = 0$
$y = 0 + 13$
$\boldsymbol{y = 13}$

8. Subtract the following:

a. 376 from (– 813)
$= -813 - 376$
$= \mathbf{-1189}$

b. (– 314) from 412
$= 412 - (-314)$
$= 412 + 314$
$= \mathbf{726}$

c. 146 from 96
$= 96 - 146$
$= \mathbf{-50}$

d. (– 124) from 316
$= 316 - (-124)$
$= 316 + 124 = \mathbf{440}$

9. Let the other integer be x
$x + 216 = (-142)$
$x = -142 - 216$
$x = -358$

10. According to the question, we get
$-214 - \{317 + (-718)\}$
$= -214 - \{317 - 718\}$
$= -214 - \{-401\}$
$= -214 + 401$
$= \mathbf{187}$

11. $(-17 - 47) + (-79)$
$= (-64) - 79 = -64 - 79$
$= -143$

SDG-Good Quality Education

12. A lady bought pencils and note book on first day = ₹ 430

Next day she bought pencils = ₹ 40

Left with her = ₹ (430 + 40 – 340) = ₹ 130

Critical Thinking Skills

Total Distance = 13 – [(3 – 1) + (3 – 1) + (3 – 1) + (3 – 1) + (3 – 1) + 3] = 0

Total jumps — 6

Revision Time

1. Represent each of the following statements with an appropriate integer:

a. A loss of ₹ 1875 = – ₹ 1875

b. Losing weight of 28 kg = – 28 kg

c. A deposit of ₹ 2095 = + ₹ 2095

d. 37°C below 0°C = – 37°C

2. Give the opposite statement for each of the following:

a. 43 km due west

b. Fall in price by 28%

c. Spending of ₹ 3728.

d. Rise in temperature.

3. Write all integers between:

a. – 4 and 3

–3, –2, –1, 0, 1, 2

b. – 10 and 0

–9, –8, –7, –6, –5, –4, –3, –2, –1

c. – 8 and 6

–7, –6, –5, –4, –3, –2, –1, 0, 1, 2, 3, 4, 5

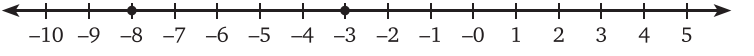
d. 0 and 8

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

4. Using number line, fill in the blanks with '<', '>':

a. – 8 ..... – 3

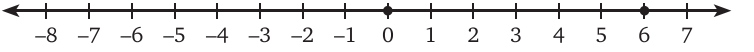
According to the number line



So, – 8 < – 3

b. 0 6

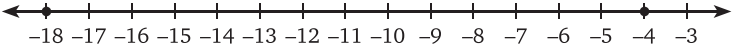
According to the number line



$0 < 6$

c. – 18 ..... – 4

According to the number line

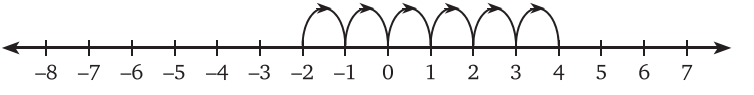


So, $–18 < –4$

5. Using number line, write the integer which is:

a. 6 more than – 2

We will start from –2 and move 6 steps forward

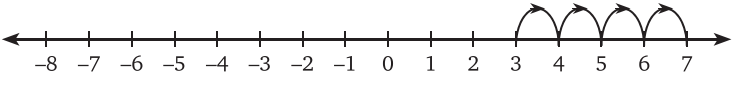


We will reach at 4

So, 6 more than –2 is 4.

b. 4 more than 3

We will start from 3 and move 4 steps forward

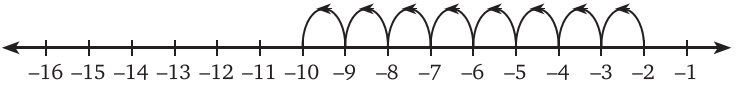


We will reach at 7

So, 4 more than 3 is 7.

c. 8 less than – 2

We will start from –2 and move 8 steps backward

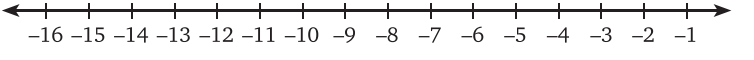


We will reach at –10

So, 8 less than –2 is –10.

d. 0 less than – 2

We will start from –2 and move 0 steps backward



So, 0 less than –2 is –2.

6. Arrange the following integers in descending order:

a. – 4, 2, – 6, – 8, 0

Since, $2 > 0 > -4 > -6 > -8$

So, descending order 2, 0, –4, –6 and –8

b. – 12, 8, – 3, – 5, – 15

Since, $8 > -3 > -5 > -12 > -15$

So, descending order 8, –3, –5, –12 and –15

c. 2, – 2, 1, 3, –4

Since, $3 > 2 > 1 > -2 > -4$

So, descending order 3, 2, 1, –2 and –4

d. 2, 3, – 1, 0, – 2

Since, $3 > 2 > 0 > -1 > -2$

So, descending order 3, 2, 0, –1 and –2

7. Evaluate the following:

a. $|17| - |18| + |19| = 17 - 18 + 19$
$= -1 + 19 = 18$

b. $|12 - 15| + |18 - 27| = |-3| + |-9|$
$= 3 + 9 = 12$

c. $|-16| - |-23 - 40| + |14| = 16 - |-63| + |14|$
$= 16 - 63 + 14$
$= 30 - 63 = -33$

d. $|-19 + 20| + |-29 - 16| = |1| + |-45|$
$= 1 + 45 = 46$

8. Simplify the following:

a. $(-16) + 7 + (-18) + (-30)$
$= -16 + 7 - 18 - 30$
$= -9 - 48 = -57$

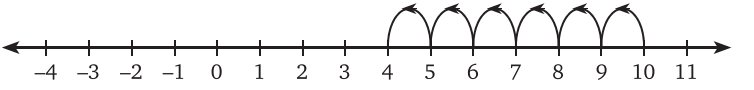
b. $(-36) + (-12) + (-3)$
$= -36 - 12 - 3$
$= -36 - 15$
$= -51$

c. $(-14) - (-16) + (-27) + (-13)$
$= -14 + 16 - 27 - 13$
$= 2 - 40 = -38$

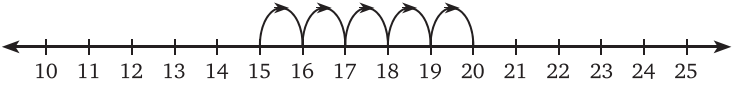
d. $(-19) + (-12) - 28$
$= -19 - 12 - 28$
$= -31 - 28 = -59$

9. Represent the following on number line:

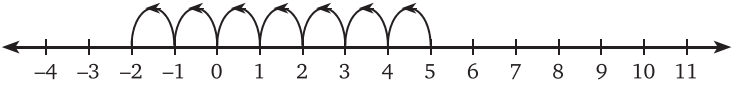
a. $7 + (3) - 6 = 10 - 6 = 4$



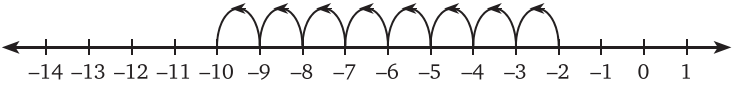
b. $18 - (3) + 5 = 15 + 5 = 20$



c. $(-4) + 5 + (-3) = 5 - 7 = -2$



d. $(-2) + (-4) - (4) = -2 - 8 = -10$



10. Find an integer 'b' such that:

a. $13 + b = 0$
$b = 0 - 13$
$\boldsymbol{b = -13}$

b. $-27 + b = 0$
$b = 0 + 27$
$\boldsymbol{b = 27}$

c. $b + 16 = 0$
$b = 0 - 16$
$\boldsymbol{b = -16}$

d. $-b - 3 = 0$
$-3 = 0 + b$
$\boldsymbol{b = -3}$

11. Let the required integer be x
$x + (-69) = -113$
$x - 69 = -113$
$x = -113 + 69$
$= -44$

12. (-13) from (9)
$9 - (-13)$
$= 9 + 13 = 21$
$21 \neq -21$
No, the values are not equal.

9 from (-13)
$-13 - 9$
$= -21$

13. Marks for 12 correct answer = $12 \times 3 = 36$
    Mark for 8 wrong answers = $-8 \times 1 = -8$
    Her score = $36 + (-8) =$ **28**
14. Distance P to $Q = 3$ units
    Distance P to $R = 3 + 5 = 8$ units

Model Test Paper-I

1. a. (iv) b. (iv) c. (ii) d. (iii) e. (ii)
2. The numbers 1, 3, 6, 10, 15, ... are known as triangular numbers because they can be arranged in the shape of an equilateral triangle.

   For example:

   1 can be represented as a single dot.

   3 can be arranged as a triangle with three dots (one on top and two below).

   6 can form a larger triangle with six dots (one on top, two in the second row, and three in the third).

   The sequence 1, 4, 9, 16, 25, ... is referred to as square numbers because they can be visually represented as squares.

   For instance:

   1 is a single unit square.

   4 can be arranged in a square formation of two by two dots.

   9 forms a three by three square.

   The series 1, 8, 27, 64, 125,... represents cubic numbers because they correspond to cubes in three-dimensional space.

   For example:

   1 is a cube with one unit volume.

   8 can be visualized as a cube of dimensions two by two by two.

   Similarly, 27 is represented by a cube of dimensions three by three by three.
3. a. *A, S, B* b. *VK, SP, VS*
   c. *AB, CD, PQ, RS* d. *AB, PQ*
4. $\angle 1 = \angle BAC$, $\angle 2 = \angle B$, $\angle 3 = \angle BCA$, $\angle 4 = \angle D$, $\angle A$, $C = \angle 5$
5. a. $\frac{1}{4}$ of a revolution = $\frac{1}{4} \times 360° = 90°$
   It starts from 6, it will stop at 9.

b. $\frac{3}{4}$ of a revolution $= \frac{3}{4} \times 360°$
$= 270°$

It starts from 3, it will stop at 12.

c. One revolution $= 360°$

If starts from 12, it will stop at 12.

d. $\frac{1}{2}$ of a revoution $= \frac{1}{2} \times 360° = 180°$

It starts from 9, it will stop at 3.

6. $18 = 5 + 7 + 6$
7. Sum and Difference of Smallest and Largest 5-Digit Palindrome:

   The smallest five-digit palindrome is 10001 and the largest is 99999.

   Sum: $10001 + 99999 = 110000$

   Difference: $99999 - 10001 = 89998$
8. 100, 50, 25, 76, 38, 19, 58, 29, 88, 44, 22, 11, 34, 17, 52, 26, 13, 40, 20, 10, 5, 16, 8, 4, 2, 1

   Yes
9. a. Do yourself
   b. D
   c. E
   d. Do yourself
10. a. $35 = 5 + 13 + 17$
    b. $49 = 7 + 19 + 23$
    c. $63 = 3 + 29 + 31$
    d. $61 = 11 + 19 + 31$
11. a. 225

3	225
3	75
5	25
5	5
	1

$225 = 3 \times 3 \times 5 \times 5$

b. 190

2	190
5	95
19	19
	1

$190 = 2 \times 5 \times 19$

Model Test Paper-II

1. a. (ii) b. (i) c. (iv) d. (iii) e. (ii)

2. Let the side of the square garden be s.

   Perimeter of the square $= 4s = 4 \times 93 = 372$ m

   Now, the total length of wire required to fence the square garden four times:

   Total length of wire = 4 × Perimeter of the square garden

   Total length of wire $= 4 \times 372 = 1488$ m

   The cost of wire at a rate of ₹ 12.25 per meter:

   Cost of wire = Total length of wire x Rate per meter

   Cost of wire = 1488 m × ₹ 12.25 per meter

   Cost of wire = ₹ 18228

   Therefore, the length of wire required to fence the square garden four times is 1488 meters, and the cost of wire at a rate of ₹ 12.25 per meter is ₹ 18228.

3. Area of the verandah = Length × Breadth

   $= 15\text{m} \times 12.5\text{m}$

   $= 187.5$ sq.m

   Convert the tile dimensions to meters:

   50 cm = 0.5 m

   30 cm = 0.3 m

   Area of 1 tile = Length × Breadth

   $= 0.5\text{ m} \times 0.3 = 0.15$ sq.m

   $$\text{Number of Tiles} = \frac{\text{Total Area}}{\text{Tile Area}}$$

   $$\text{Number of Tiles} = \frac{187.5\text{ sq. m}}{0.15\text{ sq. m}}$$

   Number of Tiles = 1250

   Total Cost = Number of Tiles × Cost per Tile

   Total Cost = 1250 × ₹ 80

   Total Cost = ₹ 100,000

   Therefore, 1250 tiles are required to pave the verandah floor, and the total cost of the tiles would be ₹ 100,000 at the rate of ₹ 80 per tile.

4. a. $\frac{6}{17}, \frac{11}{34}, \frac{15}{51}, \frac{25}{68}$

First we have to convert unlike fraction into like fractions.

LCM of 17, 34, 51 and 68 is 204

Now, $\frac{6}{17} = \frac{6 \times 12}{17 \times 12} = \frac{72}{204}$ $\quad \frac{11}{34} = \frac{11 \times 6}{34 \times 6} = \frac{66}{204}$

$\frac{15}{51} = \frac{15 \times 4}{51 \times 4} = \frac{60}{204}$ $\quad \frac{25}{68} = \frac{25 \times 3}{68 \times 3} = \frac{75}{204}$

Since, $60 < 66 < 72 < 75$

So, the ascending order $\frac{15}{51}, \frac{11}{34}, \frac{6}{17}, \frac{25}{68}$

b. $\frac{3}{5}, \frac{7}{15}, \frac{9}{20}, \frac{3}{10}$

First we have to convert unlike fraction into like fractions.

LCM of 5, 15, 20 and 10 is 60

Now, $\frac{3}{5} = \frac{3 \times 12}{5 \times 12} = \frac{36}{60}$ $\quad \frac{7}{15} = \frac{7 \times 4}{15 \times 4} = \frac{28}{60}$

$\frac{9}{20} = \frac{9 \times 3}{20 \times 3} = \frac{27}{60}$ $\quad \frac{3}{10} = \frac{3 \times 6}{10 \times 6} = \frac{18}{60}$

Since, $18 < 27 < 28 < 32$

So, the ascending order $\frac{3}{10}, \frac{9}{20}, \frac{7}{15}, \frac{3}{5}$

5. a. $7\frac{2}{5} - 3\frac{2}{15} + 1\frac{7}{10} = \frac{37}{5} - \frac{47}{15} + \frac{17}{10}$

$= \frac{37 \times 6 - 47 \times 2 + 17 \times 3}{30}$

$= \frac{222 - 94 + 51}{30} = \frac{273 - 94}{30}$

$= \frac{179}{30} = 5\frac{29}{30}$

b. $7\frac{2}{5} - 3\frac{1}{12} + 3\frac{7}{10} = \frac{37}{5} - \frac{37}{12} + \frac{37}{10}$

$= \frac{37 \times 12 - 37 \times 5 + 37 \times 6}{60}$

$= \frac{444 - 185 + 222}{60} = \frac{481}{60}$

$= 8\frac{1}{60}$

6. Cost of two pens $= ₹\ 25\frac{2}{5} = ₹\ \frac{127}{5}$

Cost of a school bag $= ₹\ 52\frac{1}{4} = ₹\ \frac{209}{4}$

Total money she spent $= ₹\ \frac{127}{5} + \frac{209}{4}$

$= ₹\ \frac{127 \times 4 + 209 \times 5}{20}$

$= ₹\ \frac{508 + 1045}{20} = ₹\ \frac{1553}{20}$

$= ₹\ 77\frac{13}{20}$

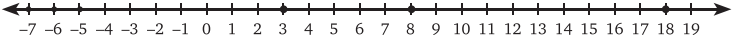
8. Do yourself

9. a. 4 b. 1 c. 4

10. Do yourself

11. a. 8, – 5, 3, – 7, 18, – 6

First we will draw the number line and mark the given integer on the number line.

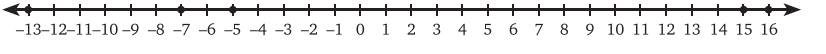


Is is clear from number line $18 > 8 > 3 > –5 > –6 > –7$

Hence, descending order is 18, 8, 3, –6, –5 and –1

b. – 5, – 13, 16, 15, – 7

First we will draw the number line and mark the given integer on the number line.



Is is clear from number line $16 > 15 > –5 > –7 > –13$

Hence, descending order is 16, 15, –5, –7, –13

12. $(–17 –47) + (– 79)$

$= (–64) – 79 = – 64 – 79$

$= – 143$