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6th Standard

Based on the New Syllabus for 2019 - 20

Term - III

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NOTE FROM PUBLISHER

It gives me great pride and pleasure in bringing to you **Sura's Mathematics Guide** for **Term III** for **6th Standard**. It is prepared as per the New Syllabus for Term-III for the year 2019-20.

This guide encompasses all the requirements of the students to comprehend the text and the evaluation of the textbook.

- Additional questions have been provided exhaustively for clear understanding of the units under study.
- Chapter-wise Unit Tests are given.

In order to learn effectively, I advise students to learn the subject section-wise and practice the exercises given. It will be a teaching companion to teachers and a learning companion to students.

Though these salient features are available in this Guide, I cannot negate the indispensable role of the teachers in assisting the student to understand the subject thoroughly.

I sincerely believe this guide satisfies the needs of the students and bolsters the teaching methodologies of the teachers.

I pray the almighty to bless the students for consummate success in their examinations.

- Publisher

All the Best

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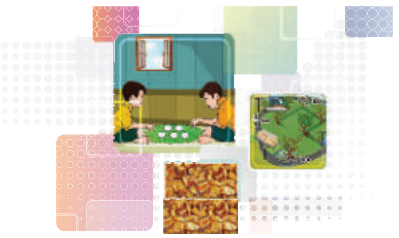
CONTENTS

CHAPTER 01

FRACTIONS



- A fraction is a number representing a part of a whole. The whole may be a single object or a group of objects.
- Fraction = $\frac{\text{Numerator}}{\text{Denominator}}$

  where the denominator represents the number of parts the whole is divided into and the numerator tells us how many of those parts are we dealing with.

  E.g. $\frac{1}{4}$ is a fraction and it is read as one fourth.
- In other words a fraction is a selected parts out of the total number of equal parts of an object or a group.

  E.g  is $\frac{1}{2}$

EQUIVALENT FRACTIONS :

- Fractions having the same values are called equivalent fractions.
- An equivalent fraction of a given fraction can be obtained by multiplying the numerator and denominator by the same number (other than zero)

  E.g. $\frac{1}{2}, \frac{2}{4}, \frac{3}{6}$ are equivalent fractions.
- An equivalent fraction of a given fraction can be obtained by dividing both the numerator and the denominator by the same number (common factor of the numerator and denominator)

  E.g. Equivalent fraction of $\frac{12}{15}$ is $\frac{4}{5}$

  $\frac{12}{15} = \frac{12 \div 3}{15 \div 3} = \frac{4}{5}$

FRACTION IN REAL LIFE

- Nine - tenth of the water on the earth is salty.

COMPARISON OF UNLIKE FRACTIONS

- To compare two or more unlike fractions we have to convert them into like fractions.
- These 'like fractions' are the equivalent fractions of the given fractions.
- The denominator of the 'like fractions' is the least common multiple (LCM) of the denominators of the given unlike fractions.

(iii) Total number of equal parts = 9

Shaded parts = 3

∴ Fraction representing the shaded parts = $\frac{3}{9}$

(iv) Total number of equal parts = 9

Shaded parts = 5

Fraction representing the shaded parts = $\frac{5}{9}$

2. Look at the following beakers. express the quantity of water as fraction and arrange them in ascending order:

Solution :

Quantity of water in the first beaker = 1 full

Quantity of water in the second beaker = $\frac{1}{4}$

Quantity of water in the third beaker = $\frac{3}{4}$

Quantity of water in the fourth beaker = $\frac{1}{2}$

Ascending order $\frac{1}{4} < \frac{1}{2} < \frac{3}{4} < 1$

3. Write the fraction of shaded part in the following.

i) 

ii) 

iii) 

Solution :

(i) Total number of equal parts = 3

shaded parts = 2

Fraction representing the shaded portion = $\frac{2}{3}$

(ii) Total number of equal parts = 4

Shaded parts = 3

Fraction representing the shaded parts = $\frac{3}{4}$

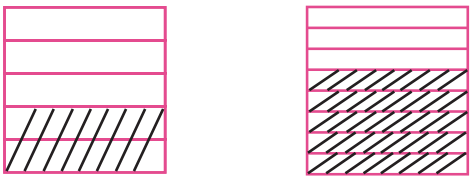
(iii) Total number of equal parts = 5

shaded parts = 4

Fraction representing the shaded parts = $\frac{4}{5}$

ii) $\frac{2}{5}$ and $\frac{5}{8}$

Shade $\frac{2}{5}$ Shade $\frac{5}{8}$



$\frac{2}{5}$ is lesser than $\frac{5}{8}$. That is $\frac{2}{5} < \frac{5}{8}$

2. Which is greater $\frac{3}{8}$ or $\frac{3}{5}$?

Solution :

LCM of the denominators 8 and 5 is 40.

Finding the equivalent fractions.

$\frac{3}{8} = \frac{3\times5}{8\times5} = \frac{15}{40}$,

$\frac{3}{5} = \frac{3\times8}{5\times8} = \frac{24}{40}$

Here $\frac{24}{40} > \frac{15}{40}$

$\therefore \quad \frac{3}{5} > \frac{3}{8}$

3. Arrange the fractions in ascending order : $\frac{3}{5}, \frac{9}{10}, \frac{11}{15}$

Solution :

Equivalent fractions of $\frac{3}{5}$ are $\frac{6}{10}, \frac{9}{15}, \frac{12}{20}, \frac{15}{25}, \frac{18}{30}$, ...

Equivalent fractions of $\frac{9}{10}$ are $\frac{18}{20}, \frac{27}{30}$,.....

Equivalent fractions of $\frac{11}{15}$ are $\frac{22}{30}$,....

Therefore $\frac{18}{30} < \frac{22}{30} < \frac{27}{30}$

The ascending order of given fractions is $\frac{3}{5} < \frac{11}{15} < \frac{9}{10}$

4. Arrange the fractions in descending order : $\frac{9}{20}, \frac{3}{4}, \frac{7}{12}$

Solution :

Equivalent fractions of $\frac{9}{20}$ are $\frac{18}{40}, \frac{27}{60}$,.....

Equivalent fractions of $\frac{3}{4}$ are $\frac{6}{8}, \frac{9}{12}, \frac{12}{16}, \frac{15}{20}, \frac{18}{24}, \frac{21}{28}, \frac{24}{32}, \frac{27}{36}, \frac{30}{40}, \frac{33}{44}, \frac{36}{48}, \frac{39}{52}, \frac{42}{56}, \frac{45}{60}$,.....

Equivalent fractions of $\frac{7}{12}$ are $\frac{14}{24}, \frac{21}{36}, \frac{28}{48}, \frac{35}{60}$,.....

TRY THESE

(Text book Page No. 15)

1. **Simplify : $35 \times \frac{3}{7}$.**

Solution :

$$35 \times \frac{3}{7} = \frac{35 \times 3}{7} = \frac{105}{7} = 15$$

2. **Find the value of $\frac{1}{5}$ of 15.**

Solution :

$$\frac{1}{5} \text{ of } 15 = \frac{1}{5} \times 15 = \frac{15}{5}$$

$$= 3$$

3. **Find the value of $\frac{1}{3}$ of $\frac{3}{4}$**

Solution :

$$\frac{1}{3} \text{ of } \frac{3}{4} = \frac{1}{3} \times \frac{3}{4}$$

$$= \frac{1 \times 3}{3 \times 4} = \frac{3}{12} = \frac{1}{4}$$

4. **Multiply $7\frac{3}{4}$ by $5\frac{1}{2}$**

Solution :

$$7\frac{3}{4} \times 5\frac{1}{2} = \frac{31}{4} \times \frac{11}{2} = \frac{31 \times 11}{4 \times 2} = \frac{341}{8}$$

Activity

(Text book Page No. 15)

Take a paper. Fold it into 4 parts vertically of equal width. Shade one part of it with red. Then, fold it into 3 parts horizontally of equal width. Shade two parts of it with blue. Now, you count the number of shaded grids which have both the colours. (Hint:The total number of grids is the product of $\frac{2}{3}$ and $\frac{1}{4}$)

Activity to be done by the students themselves

TRY THESE

(Text book Page No. 17)

(i) **How many 6s are there in 18?**

Solution :

Number of 6s in 18 are $\frac{18}{6} = 3$

(ii) **How many $\frac{1}{4}$s are there in 5?**

Solution :

Number of $\frac{1}{4}$s in 5 are $5 \div \frac{1}{4} = 5 \times \frac{4}{1} = 20$

(iii) $\frac{1}{3} \div 5 = ?$

Solution :

$$\frac{1}{3} \div 5 = \frac{1}{3} \times \frac{1}{5} = \frac{1}{15}$$

(iii) $\frac{3}{8}\times\frac{4}{5} = \frac{3\times4}{8\times5} = \frac{12}{40} = \frac{3}{10}$

$\frac{3}{8}\times\frac{4}{5} = \frac{3}{10}$

$\frac{3}{\cancel{8}_{2}}\times\frac{\cancel{4}^{1}}{5} = \frac{3}{10}$

(iv) $3\frac{5}{7}\times1\frac{1}{13} = \frac{26}{7}\times\frac{14}{13}$

$3\frac{5}{7}\times1\frac{1}{13} = 4$

$\frac{\cancel{26}^{2}\times\cancel{14}^{2}}{\cancel{7}\times\cancel{13}}$

6. Divide the following :

(i) $\frac{3}{7}\div4$ (ii) $\frac{4}{3}\div\frac{5}{9}$ (iii) $4\frac{1}{5}\div3\frac{3}{4}$ (iv) $9\frac{2}{3}\div1\frac{2}{3}$

Solution :

(i) $\frac{3}{7}\div4 = \frac{3}{7}\times\frac{1}{4}$ [Reciprocal of 4 is $\frac{1}{4}$]

$= \frac{3}{28}$

$\frac{3}{7}\div4 = \frac{3}{28}$

(ii) $\frac{4}{3}\div\frac{5}{9} = \frac{4}{3}\times\frac{9}{5}$ [Reciprocal of $\frac{5}{9}$ is $\frac{9}{5}$]

$= \frac{36}{15} = 2\frac{6}{15} = 2\frac{2}{5}$

$\frac{4}{3}\div\frac{5}{9} = 2\frac{2}{5}$

$15\overline{)36}\ 2$, 30, 6

$\frac{36}{15} = 2\frac{6}{15}$

(iii) $4\frac{1}{5}\div3\frac{3}{4} = \frac{21}{5}\div\frac{15}{4}$

$= \frac{21}{5}\times\frac{4}{15}$ [Reciprocal of $\frac{15}{4}$ is $\frac{4}{15}$]

$= \frac{84}{75} = 1\frac{9}{75} = 1\frac{3}{25}$

$4\frac{1}{5}\div3\frac{3}{4} = 1\frac{3}{25}$

$75\overline{)84}\ 1$, 75, 9

(iv) $9\frac{2}{3}\div1\frac{2}{3} = \frac{29}{3}\div\frac{5}{3}$

$= \frac{29}{\cancel{3}}\times\frac{\cancel{3}}{5} = \frac{29}{5}$ [Reciprocal of $\frac{5}{3}$ is $\frac{3}{5}$]

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

$9\frac{2}{3}\div1\frac{2}{3} = 5\frac{4}{5}$

$5\overline{)29}\ 5$, 25, 4

$$= \frac{3\times 27}{2\times 4}$$

$$= \frac{81}{8} = 10\frac{1}{8} \text{ kg}$$

$$8\overline{)81}\ 10,\ 80,\ 01$$

Weight of apples Kalai bought = $10\frac{1}{8}$ kg

5. The length of the staircase is $5\frac{1}{2}$ m. If one step is set at $\frac{1}{4}$ m, then how many steps will be there in the staircase?

Solution :

Length of the staircase = $5\frac{1}{2}$ m

Distance between each step = $\frac{1}{4}$ m

$\therefore$ Number of steps in the staircase = $5\frac{1}{2} \div \frac{1}{4}$

$$= \frac{11}{2} \div \frac{1}{4} = \frac{11}{2} \times \frac{4}{1} = 22$$

There will be 22 steps in the staircase

Challenge Problems

6. By using the following clues, find who am I?

(i) Each of my numerator and denominator is a single digit number.

(ii) The sum of my numerator and denominator is a multiple of 3.

(iii) The product of my numerator and denominator is a multiple of 4

Solution :

The numerator may be any one of 1, 2, 3, 4, 5, 6, 7, 8, 9 and the denominator may be any one of 1, 2, 3, 4, 5, 6, 7, 8, 9. Sum of numerator and denominator is a multiple of 3.

$\therefore$ Possible proper fractions are $\frac{1}{2}, \frac{1}{5}, \frac{1}{8}, \frac{2}{4}, \frac{2}{7}, \frac{3}{6}, \frac{3}{9}, \frac{4}{5}, \frac{4}{8}, \frac{5}{7}, \frac{6}{9}$.

Also given the product of numerator and denominator is a multiple of 4.

$\therefore$ Possible fractions are $\frac{1}{8}, \frac{2}{4}, \frac{4}{5}, \frac{4}{8}$.

7. Add the difference between $1\frac{1}{3}$ and $3\frac{1}{6}$ and the difference between $4\frac{1}{6}$ and $2\frac{1}{3}$.

Solution :

We have to find $(3\frac{1}{6} - 1\frac{1}{3}) + (4\frac{1}{6} - 2\frac{1}{3})$

$$= \left(\frac{19}{6} - \frac{4}{3}\right) + \left(\frac{25}{6} - \frac{7}{3}\right) \qquad \left[\because 3\frac{1}{6} > 1\frac{1}{3} \text{ and } 4\frac{1}{6} > 2\frac{1}{3}\right]$$

$$= \left(\frac{19}{6} - \frac{8}{6}\right) + \left(\frac{25}{6} - \frac{14}{6}\right)$$

$$= \frac{11}{6} + \frac{11}{6}$$

$$= \frac{22}{6} = 3\frac{4}{6} = 3\frac{2}{3}$$

$$6\overline{)22}\ 3,\ 18,\ 4 \qquad \frac{22}{6} = 3\frac{4}{6}$$

iii) Distance of (i) [via bus stop] $= 4\frac{1}{4}$ km

Distance of (ii) [via Hospital] $= 5\frac{3}{4}$ km

$$4\frac{1}{4} < 5\frac{3}{4}$$

$\therefore$ (i) is the shortest distance via bus stop

iv) Distance between school and Hospital $= 4\frac{1}{2}$ km

Distance between school and bus stop $= \frac{3}{4}$ km

$$\text{Ratio} = 4\frac{1}{2} : \frac{3}{4}$$

$$= \frac{9}{2} : \frac{3}{4} = \frac{18}{4} : \frac{3}{4} = 6 : 1$$

The distance between school and Hospital is 6 times the distance between school and bus stop.

PROBLEMS

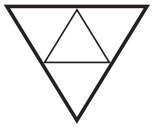
ADDITIONAL QUESTIONS

1. Color the part according to the given fraction.

i)

$\frac{3}{4}$

ii)

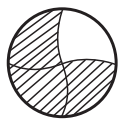


$\frac{2}{4}$

Solution :

(i) Here $\frac{3}{4}$ shows out of 4 parts

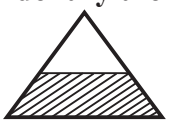
3 parts are shaded



ii) Here $\frac{2}{4}$ shows out of 4 parts

2 parts are shaded

2. Identify the error if any



This is $\frac{1}{2}$

Solution :

In the given figure, shaded portion is not equal to unshaded portion. So the fraction is not equal to $\frac{1}{2}$.

8. $\frac{21}{19}$ can be expressed as

(a) $2\frac{3}{19}$ (b) $2\frac{1}{19}$ (c) $1\frac{2}{19}$ (d) $3\frac{1}{19}$

9. When $\frac{1}{7}$ is written with denominator 56, its numerator is

(a) 3 (b) 8 (c) 24 (d) 12

10. If $\frac{7}{9} = \frac{28}{36}$, the value of p is

(a) 23 (b) 2 (c) 36 (d) 16

II. Fill in the blanks 5×1=5

11. A fraction with numerator greater then the denominator is called as _____.

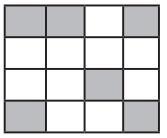
12. $13\frac{5}{11}$ is a _____ fraction.

13. $\frac{5}{14}+\frac{11}{17}$ = _____

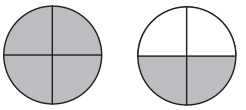
14. 1 Whole = _____ tenths.

15. $\frac{19}{7}$ is equal to the mixed fraction _____.

III. Match the following 5×1=5

16. 

17. 

18. 

19. 

20. $\frac{1}{7}+\frac{3}{7}$ =

(a) $\frac{6}{8}$

(b) $\frac{4}{7}$

(c) $\frac{4}{4}$

(d) $\frac{6}{16}$

(e) $\frac{6}{7}$

PART - B

IV. Answer any ten questions 10×2=20

21. What fraction of a day is 6h?

22. What fraction of a kg is 550 g?

CHAPTER 02

INTEGERS

- When zero is included to the set of natural numbers, then the set of numbers is called as "Whole Numbers".
- The set of numbers ....., –3, –2, –1, 0, 1, 2, 3,..... is called Integers. It is denoted by the letter Z. The numbers .....–3, –2, –1 to the left of zero is negative integers, and 1, 2, 3,.... are positive integers.
- The number 0 is neither positive nor negative.
- Two numbers that are at the same distance from '0' on the number line, but are on the opposite sides of it, are opposite to each other.
- The opposite of the opposite of a number is the number itself. E.g. – (–5) = 5.
- Natural numbers are called as positive integers and whole numbers are called as 'non-negative' integers.
- Positive and negative numbers together are called as signed numbers.
- Signed numbers are also called as 'Directed Numbers'.
- The number line can be shown in horizontal and vertical directions.
- The positive number can be written without sign., E.g. 5 is considered as +5.
- The letter 'Z' was first used by Germans. In German language 'Zahlen' means 'number'.
- Opposite of zero is zero.
- Opposite of a positive integer is negative.
- Opposite of a negative integer is positive. E.g. opposite of 2 is –2
- For a given number its predecessor one less than it and its successor is one more than it.

  E.g. Predecessor of 0 is –1 and

  Successor of 0 is +1
- Every positive integer is greater than each of the negative integers. E.g. $3 > -5$
- 0 is less than every positive integer
- 0 is greater then every negative integer.

  E.g. $0 < 2$ but $0 < -2$.

EXERCISE 2.1 (Text book Page No. 32-34)

1. Fill in the blanks.

(i) The potable water available at 100 m below the ground level is denoted as _____ m.

Hint : Below ground level – negative; ground level – 0; above ground level – positive. **[Ans : –100]**

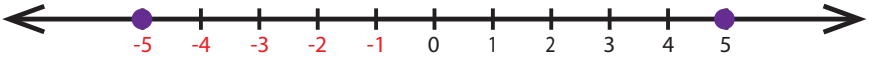
(ii) A swimmer dives to a depth of 7 feet from the ground into the swimming pool. The integer that represents this, is _____ feet.

Hint : Below ground level – negative numbers. **[Ans : –7]**

(iii) –46 is to the _____of –35 on the number line.

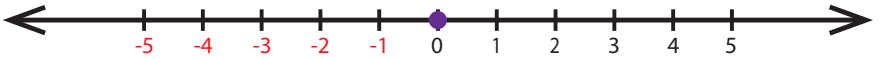
Hint : – 46 < – 35 **[Ans : Left]**

(iv) There are _____ integers from –5 to +5 (both inclusive).



[Ans : 11]

(v) _____is an integer which is neither positive nor negative.



[Ans : 0]

2. Say True or False.

(i) Each of the integers –18, 6, –12, 0 is greater than –20. **[Ans: True]**

(ii) –1 is to the right of 0. **[Ans: False]**

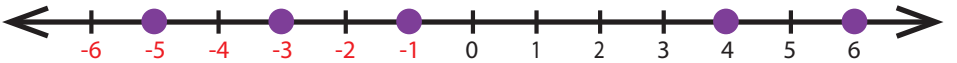
(iii) –10 and 10 are at equal distance from 1. **[Ans: False]**

(iv) All negative integers are greater than zero. **[Ans: False]**

(v) All whole numbers are integers. **[Ans: True]**

3. Mark the numbers 4, –3, 6, –1 and –5 on the number line.

Ans:

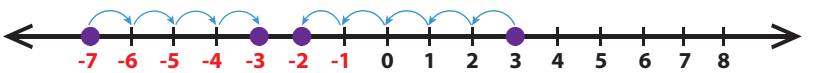


4. On the number line, which number is

i) 4 units to the right of –7?

ii) 5 units to the left of 3?

Solution :



(i) – 3 is 4 units to the right of –7

(ii) – 2 is 5 units to the left of 3

5. Find the opposite of the following numbers.

(i) 44 (ii) –19 (iii) 0 (iv) –312 (v) 789

Solution :

(i) Opposite of 44 is – 44

(ii) Opposite of – 19 is + 19 or 19

(iii) Opposite of 0 is 0

Solution :

i) 14, 27, 15, –14, –9, 0, 11, –17

- Separating the positive integers 14, 27, 15, 11 and negative integers –14, –9, –17
- Arranging in descending order we get the positive integers 27, 15, 14, 11 and the negative integers –9, –14, –17.
- '0' is neither positive nor negative and so it stand in middle.
- ∴ The numbers in descending order : 27, 15, 14, 11, 0, –9, –14, –17

ii) –99, –120, 65, –46, 78, 400, –600

- Separating the positive integers 65, 78, 400 and negative integers –99, –120, –46, –600
- Arranging the positive integers in descending order as 400, 78, 65 and the negative integers in descending order –46, –99, –120, –600.
- The numbers in descending order : 400, 78, 65, –46, –99, –120, –600.

iii) 111, –222, 333, –444, 555, –666, 7777, –888

- Separating the positive integers 111, 333, 555, 7777 and negative integers –222, –444, –666, –888
- Arranging the positive integers in descending order as 7777, 555, 333, 111 and negative integers in descending order as –222, –444, –666, –888
- The numbers in descending order : 7777, 555, 333, 111, –222, –444, –666, –888

Objective Type Questions

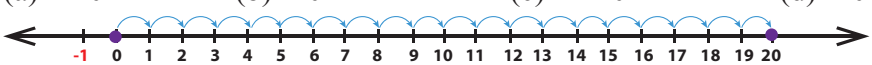
12. There are _____positive integers from – 5 to 6.

(a) 5 (b) 6 (c) 7 (d) 11

Ans: (b) 6

13. The opposite of 20 units to the left of 0 is _____

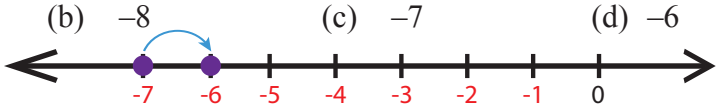
(a) 20 (b) 0 (c) –20 (d) 40



Ans: (a) 20

14. One unit to the right of –7 is.....

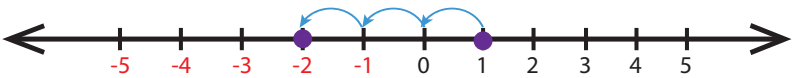
(a) +1 (b) –8 (c) –7 (d) –6



Ans: (d) –6

15. 3 units to the left of 1 is

(a) –4 (b) –3 (c) –2 (d) 3



Ans: (c) –2

12. Complete the table using the following hints:

C1 : the first non-negative integer.
C3 : the opposite to the second negative integer.
C5 : the additive identity in whole numbers.
C6 : the successor of the integer in C2.
C8 : the predecessor of the integer in C7
C9 : the opposite to the integer in C5.

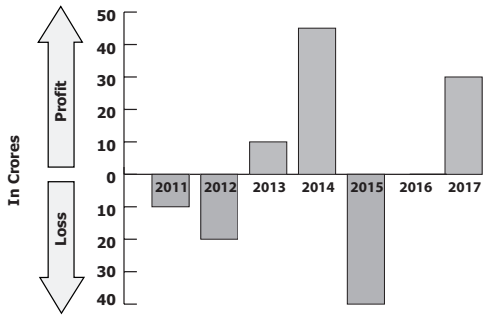
C1	C2 –5	C3
C4 6	C5	C6
C7 –7	C8	C9

Solution :

C1 : First non negative integer is 0
C3 : Second negative integer is –2 its opposite is 2
C5 : 0 is the additive identity in whole numbers
C6 : C2 has –5. Its successor is –4
C8 : Integer in C7 is –7. Predecessor of –7 is –8
C9 : C5 has 0. Opposite of 0 is 0.

C1 0	C2 –5	C3 2
C4 6	C5 0	C6 –4
C7 –7	C8 –8	C9 0

13. The following bar graph shows the profit (+) and loss (–) of a small scale company (in crores) between the years 2011 to 2017.



i) Write the integer that represents a profit or a loss for the company in 2014?
ii) Denote by an integer on the profit or loss in 2016.
iii) Denote by integers on the loss for the company in 2011 and 2012
iv) Say True or False: The loss is minimum in 2012.
v) Fill in: The amount of loss in 2011 is _____as profit in 2013.

Solution :

i) Profit ₹ 45 crores. ∴ Ans : + 45
ii) In 2016 neither profit nor loss happened. ∴ Ans : 0
iii) In 2011 loss is 10 crores and in 2012 loss is 20 crores. Ans : –10 and –20.
iv) False. In 2011 the company's loss is minimum.
v) The same. Because in 2013 the profit is 10 crores and in 2011 the loss is 10 crores.

ADDITIONAL PROBLEMS

1. Write all the integers between –5 and 10.

Solution :

On the number line, the number increases as we move to right and decreases as we move to the left
∴ –4, –3, –2, –1, 0, 1, 2, 3, 4, 5, 6, 7, 8, 9.

24. **Write the following numbers with appropriate sign.**
(a) 100 m below sea level
(b) 5°C below 0°C temperature.

25. **Represent the following using integers with proper sign.**
(a) 35 km above sea level
(b) A loss of ₹ 200

26. **How many integers are there between –5 and 0?**

27. **What is the opposite of depositing money in the bank?**

28. **Give an integer which is neither positive nor negative?**

29. **Write all the integers between – 10 and – 5.**

30. **Write the following using integers with appropriate sign**
a) 10 m above sea level.
b) 200 m below sea level

31. **What is the opposite of the following**
a) Decrease in size
b) profit of ₹ 100

32. **Using number line, how will you compare**
a) two negative integers?
b) two positive integers?
c) one positive and one negative integer?

33. **Write the following in ascending order.**
a) 8, 7, –3, 2, 0, 4,
b) 3, 6, 5, 10, –10, 9, 8.

34. **Write the following in descending order.**
a) 0, –5, 10, 6, –3, 9,
b) –99, +98, –97, +97, 4, 1, 90

35. **Using + or – indicate the following**
a) A train is late by 30 min.
b) A gain of ₹ 1500

Part - C

V. Answer any five questions 3 × 5 = 15

36. **Say True or false. Justify your answer.**
a) –8 is to the right of –11 on the number line.
b) Smallest negative integer is –1.
c) –25 is greater than –24.

37. **Write four negative integers between –20 and –100**

38. **In each of the following which number is to the right of the other on the number line?**

a) 0, –1
b) 2, 9
c) –6, 6
d) –3, –8
e) –11, 10
f) 1, –100

CHAPTER 03

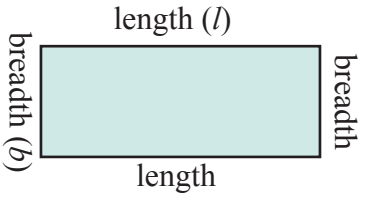
PERIMETER AND AREA

PERIMETER.

- The length of the boundary of any closed shape is called its perimeter.
- Hence, 'the measure around' of a closed shape is called its perimeter.
- The unit of perimeter is the unit of length itself.
- The units of length may be expressed in terms of metre, millimetre, centimetre, kilometre, inch, feet, yard etc.
- The word perimeter is derived from the greek words 'peri' and 'metron' where 'peri' means 'around' and 'metron' means 'measure'

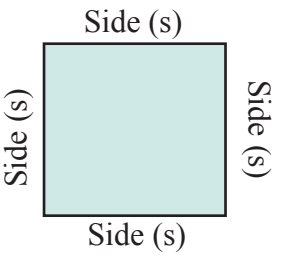
PERIMETER OF A RECTANGLE :

- In a rectangle the opposite sides are equal in length
- Perimeter of a rectangle $P = 2(l + b)$ units. Where P - perimeter, l - length, b - breadth of a rectangle.



PERIMETER OF A SQUARE :

- In a square, all the sides are equal in length.
- The perimeter of a regular shape with any number of sides = number of sides × length of a side.
- Perimeter of a square P = 4 × s = 4s units where s is the side of the square.



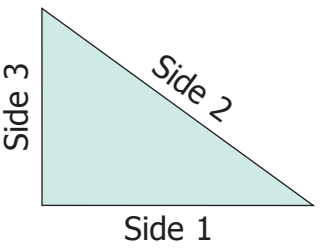
PERIMETER OF A TRIANGLE :

- If three sides of a triangle are taken as a, b, and c, then the perimeter of the triangle

$$P = (a + b + c) \text{ units}$$

AREA:

Area is the measure of the region / surface occupied by a closed figure.



AREA OF A RECTANGLE :

- Area of a Rectangle = $(l \times b)$ sq. units.

where l - length and b - breadth of the rectangle.

- Square units can also be written as unit^2.

AREA OF A SQUARE :

- If the length and breadth of a rectangle are equal, then it becomes a square.
- If the length (l) = breadth (b) = side (s), then the rectangle becomes a square.
- Area of a square = $(s \times s)$ sq.units. where s - side,

Solution :

i) Total number of tiles required = 16
Number of tiles already filled = 7
Remaining required tiles = 16 – 7 = 9

ii) Total number of tiles required = 12
Number of tiles already filled = 6
Remaining required tiles = 12 – 6 = 6

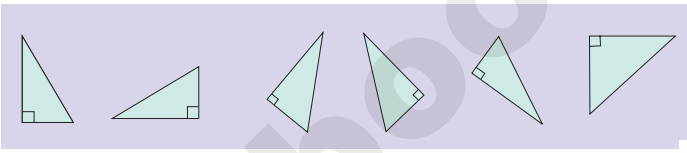
iii) Total number of tiles required = 12
Number of tiles already filled = 6
Remaining required tiles = 12 – 6 = 6

iv) Total number of tiles required = 16
Number of tiles already filled = 8
Remaining required tiles = 16 – 8 = 8

Activity

(Text book Page No. 45)

1. Mark the base and height of the following right angled triangle.



Activity to be done by the students themselves

TRY THESE

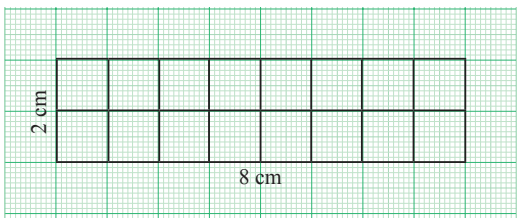
(Text book Page No. 45)

1. Draw the following in a graph sheet?

i) Two different rectangles whose areas are 16 cm^2 each.

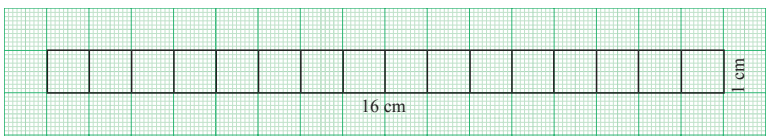
Solution :

a)

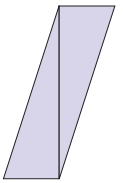
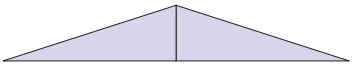
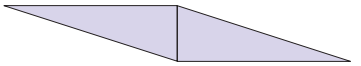


Area = 8 × 2 = 16 cm^2

b)



Area = 16 × 1 = 16 cm^2

2		
3		
4		
5		
6		

Based on the above activity answer the following questions:

i) Are the perimeters same for all the shapes?

ii) Which shape has the longest perimeter?

iii) Which shape has the shortest perimeter?

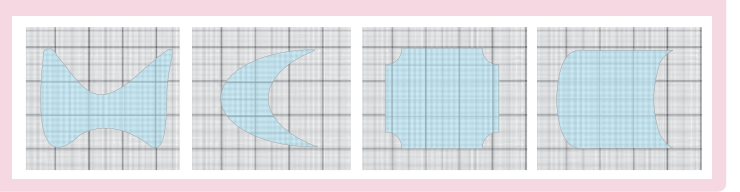
iv) Are the areas of all the shapes same? why?

Activity to be done by the students themselves

TRY THESE

(Text book Page No. 49)

1. Find the approximate area of the following figures:



Solution :

i) Approximate area = Number of full squares + Number of more than half squares + $\frac{1}{2}$ × Number of half squares

$= 2 + 3 + \frac{1}{2} \times 4$

$= 5 + 2 = 7 \text{ cm}^2$

ii) Approximate area = Number of full squares + Number of more than half squares + $\frac{1}{2}$ × Number of half squares

$= 1 + 2 = 3 \text{ cm}^2$

3. The table given below contains some measures of the right angled triangle. Find the unknown values.

S. No	Base	Height	Area
i)	20 cm	40 cm	?
ii)	5 feet	?	20 square feet
iii)	?	12m	24 square metre

Solution :

Area of the right triangle $= \frac{1}{2} \times (\text{base} \times \text{height}) \text{ unit}^2$

i) $b = 20$ cm

$h = 40$ cm

$\text{Area} = \frac{1}{2} (b \times h) \text{ cm}^2$

$= \frac{1}{2} \times 20 \times 40 = 400 \text{ cm}^2$

$A = 400 \text{ cm}^2$

ii) $b = 5$ feet

$\text{Area} = \frac{1}{2} \times b \times h \text{ unit}^2$

$20 = \frac{1}{2} \times 5 \times h$ sq.feet

$\frac{20 \times 2}{5} = h$

$h = 8$ feet

iii) $\text{Area} = \frac{1}{2} \times (\text{base} \times \text{height}) \text{ unit}^2$

$24 = \frac{1}{2} \times \text{base} \times 12 \text{ m}^2$

$\text{base} = \frac{24 \times 2}{12} \text{ m} = 4 \text{ m}$

$\text{Base} = 4\text{m}$

Tabulating the unknown values

S.No	Base	Height	Area
i	20 cm	40 cm	400 cm^2
ii	5 feet	8 feet	20 square feet
iii	4 m	12 m	24 sqaure metre

4. The table given below contains some measures of the triangle. Find the unknown values.

S. No	Side 1	Side 2	Side 3	Perimeter
i)	6 cm	5 cm	2 cm	?
ii)	?	8 m	3 m	17 m
iii)	11 feet	?	9 feet	28 feet

Solution :

Perimeter of a triangle = sum of three sides.

12. A square park has 40 m as its perimeter. What is the length of its side? Also find its area.

Solution :

Given perimeter = 40 m

Perimeter of a square = 4 × Length of a side

$40 = 4 \times$ Length of a side

$\therefore$ Length of its side $= \frac{40}{4}$ m = 10 m

$\therefore$ Side of the park = 10m

Area of a square = (Side × side) unit^2

$= (10 \times 10)$ m^2 = 100 m^2

$\therefore$ Area of the Park = 100 m^2

13. The scalene triangle has 40 cm as its perimeter and whose two sides are 13 cm and 15 cm, find the third side.

Solution :

Given two sides of a scalene triangle are 13 cm and 15 cm

Perimeter of the triangle = sum of three sides

$40 = 13 + 15 +$ Third side

$40 = 28 +$ Third side

$\therefore$ Third side $= 40 - 28 = 12$ cm

$\therefore$ The third side of the triangle = 12 cm

14. A field is in the shape of right angled triangle whose base is 25 m and height 20 m. Find the cost of levelling the field at the rate of ₹ 45/- per sq. m.

Solution :

Area of a right angled triangle $= \frac{1}{2} \times$ (base × height) unit^2

base = 25 m

height = 20 m

$\therefore$ Area $= \frac{1}{2} \times (25 \times 20)$

Area = 250 m^2

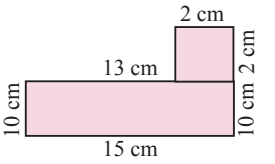
Cost of levelling per m^2 = ₹ 45.

$\therefore$ Cost of levelling 250 m^2 = 250 × 45 = ₹ 11,250

Cost of levelling = ₹ 11,250

$$\begin{array}{r} 250 \\ 45 \\ \hline 1250 \\ 1000 \\ \hline 11{,}250 \end{array}$$

15. A square of side 2 cm is joined with a rectangle of length 15 cm and breadth 10 cm. Find the perimeter of the combined shape.



Solution :

Perimeter of the combined shape = Lengths of the outer boundaries

= (15 + 10 + 2 + 2 + 2 + 13 + 10) cm

= 54 cm

Perimeter = 54 cm

Challenge Problems

6. A closed shape has 20 equal sides and one of its sides is 3 cm. Find its perimeter.

Solution :

Number of equal sides in the shape = 20

One of its side = 3 cm

Perimeter = length of one side × Number of equal sides

$\therefore$ Perimeter = (3×20) cm = 60 cm

$\therefore$ Perimeter = 60 cm

7. A rectangle has length 40 cm and breadth 20 cm. How many squares with side 10 cm can be formed from it.

Solution :

Area of rectangle = (length × breadth) units^2

Length = 40 cm

Breadth = 20 cm

$\therefore$ Area = (40×20) cm^2

= 800 cm^2

Area of the rectangle = 800 cm^2

Area of square = (side × side) units^2

side = 10 cm

$\therefore$ Area of square = (10×10) cm^2

= 100 cm^2

$$\text{Required number of squares} = \frac{\text{Area of Rectangle}}{\text{Area of 1 square}} = \frac{800 \text{ cm}^2}{100 \text{ cm}^2} = 8$$

8 squares can be formed.

8. The length of a rectangle is three times its breadth. If its perimeter is 64 cm, find the sides of the rectangle.

Solution :

Given perimeter of a rectangle = 64 cm

Also given length is three times its breadth.

Let the breadth of the rectangle = b cm

$\therefore$ Length = $3 \times b$ cm

Perimeter = 64 m

i.e., $2 \times (l + b) = 64$ m

$2 \times (3b + b) = 64$ m

$2 \times 4b = 64$m

$$4b = \frac{64}{2} \text{ m} = 32 \text{ m}$$

$$b = \frac{32}{4} = 8 \text{ m}$$

$l = 3 \times b = 3 \times 8 = 24$ m

$\therefore$ Breadth of the rectangle = 8 m

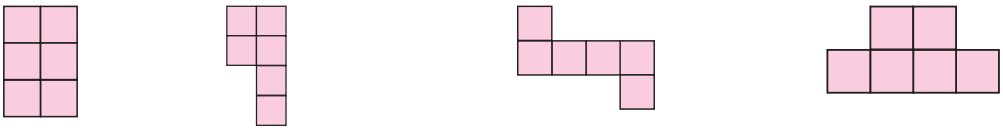
Length of the rectangle = 24 m

UNIT TEST

Time : 2.30 hrs **Part - A** **Max Marks : 60**

I. Choose the best answer. **10 × 1 = 10**

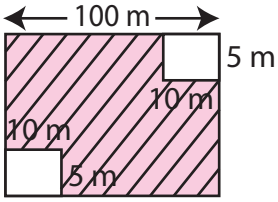
1. Following figures are formed by joining six unit squares. Which figure has the smallest perimeter ?



(i) (ii) (iii) (iv)

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

2. Length of the boundary of shaded portion in the square is



a) 360 m b) 400 m c) 340m d) 460 m

3. The perimeter of a triangle whose sides are 2 cm, 3 cm and 4 cm is _____.

a) 7 cm b) 8 cm c) 9 cm d) 9 m

4. The perimeter of a rectangle whose sides are 1m 30 cm and 70 cm is

a) 20 m b) 4 m c) 0.2 m d) 2 m 30 cm

5. The side of a square is 10 cm. How many times will the new perimeter be, if the side of the square is doubled?

a) 2 times b) 4 times c) 6 times d) 8 times

6. The perimeter of a square whose each side is 1m 30 cm is _____.

a) 5 m b) 5.1 m c) 5.2 m d) 5.3 m

7. The perimeter of an equilateral triangle of side 5cm each is _____.

a) 15.4 cm b) 15.5cm c) 10 cm d) 15 cm

8. Cost of fencing a rectangular park of length 200 m and width 150m at the rate of ₹ 25 per meter is _____.

a) ₹17,500 b) ₹1,750 c) ₹1,705 d) ₹10,750

2. **Say True or False.**

i) **A rectangle has four lines of symmetry.** **[Ans : False]**

ii) **A shape has reflection symmetry if it has a line of symmetry.** **[Ans : True]**

iii) **The reflection of the name RANI is INAЯ** **[Ans : False**

iv) **Order of rotation of a circle is infinite.** **[Ans : True]**

v) **The number 191 has rotational symmetry.** **[Ans : False]**

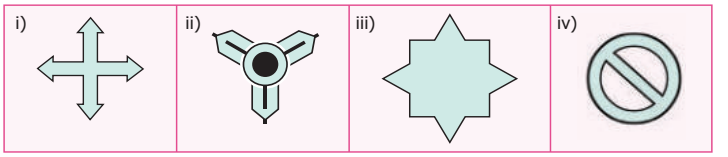
3. **Match the following shapes with their number of lines of symmetry.**

i)	Square	a)	No line of symmetry
ii)	Parallelogram	b)	One line of symmetry
iii)	Isosceles triangle	c)	Two lines of symmetry
iv)	Rectangle	d)	Four lines of symmetry

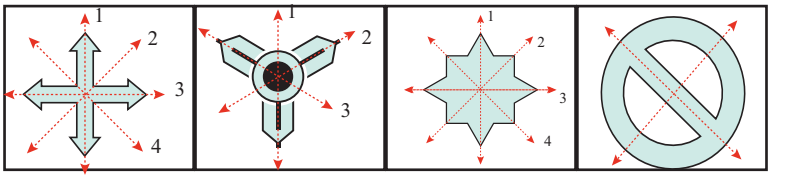
Solution :

i)	Square	d)	Four lines of symmetry
ii)	Parallelogram	a)	No line of symmetry
iii)	Isosceles triangle	b)	One line of symmetry
iv)	Rectangle	c)	Two lines of symmetry

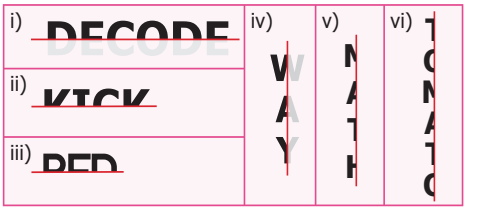
4. **Draw the lines of symmetry of the following.**



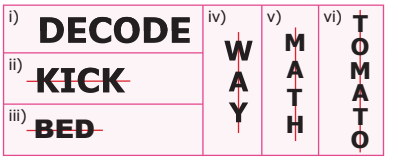
Solution :

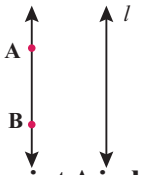


5. **Using the given horizontal line / vertical line as a line of symmetry, complete each alphabet to discover the hidden word.**

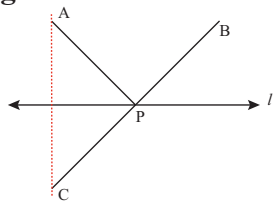


Solution :





38. In figure the point C is the image of point A in line l and line segment BC intersects the line l at P.



a) Is the image of P in line l, the point P itself?

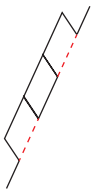
b) Is PA = PC?

c) Is PA + PB = PC + PB?

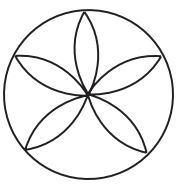
39. Draw the images P, Q and R of the points P, Q and R respectively in the line n. Join PQ and QR to form an angle PQR - Measure and see $\angle PQR = \angle P^1Q^1R^1$.

40. Complete the following figures.

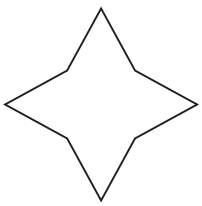
i) ii)



41. Find the number of lines of symmetry of the figure



42. Draw the line of symmetry of the figure



43. Complete the figure

Part - D

VI. Answer the following 1 × 5 = 5

44. a) Consider the letters in English alphabets from A to Z. List the following.

a) having vertical lines of symmetry.

b) horizontal lines of symmetry

c) no lines of symmetry

(or)

b) For any 5 English alphabets give its reflection on mirror.

ii) 36 and 12

Solution :

By Euclid's game

$$\text{HCF}(36, 12) = \text{HCF}(36 - 12, 12) = \text{HCF}(24, 12)$$
$$= \text{HCF}(12, 12) = 12$$

$\therefore$ HCF (36, 12) = 12

iii) 15 and 29

Solution :

Here 29 > 15

$$\text{HCF}(29, 15) = \text{HCF}(15, 29 - 15)$$
$$= \text{HCF}(15, 14)$$
$$= \text{HCF}(14, 1)$$
$$= 1$$

$\therefore$ HCF (29, 15) = 1

6. Find HCF of 48 and 28. Also find the HCF of 48 and the number obtained by finding their difference.

Solution :

HCF (48, 28)

$$48 = 2 \times 2 \times 2 \times 2 \times 3$$
$$28 = 2 \times 2 \times 7$$

$\therefore$ HCF (48, 28) = 2×2

HCF (48, 28) = 4

2	48
2	24
2	12
2	6
3	3
	1

2	28
2	14
7	7
	1

Difference of 48 and 28 is 48 – 28 = 20.

Now to find HCF (48, 20)

$$48 = 2 \times 2 \times 2 \times 2 \times 3$$
$$20 = 2 \times 2 \times 5$$

HCF (48, 20) = 2×2

$$= 4$$

HCF (48, 20) = 4

2	20
2	10
	5

7. Give instructions to fill in a bank withdrawal form issued in a bank.

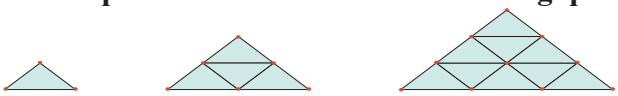
Solution :

Instructions:

* Fill the date of withdrawal.
* Fill the account number in the proper place.

8.00 pm to 9.00pm - Dinner & Recreation
9.00 pm to 10.00pm - Tamil and English

10. Observe the geometrical pattern and answer the following questions

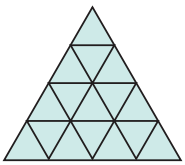


i) Write down the number of sticks used in each of the iterative pattern.
ii) Draw the next figure in the pattern also find the total number sticks used in it.

Solution :

i) Number of sticks used in first pattern = 3
Number of sticks in second pattern = 9
Number of sticks in third pattern = 18

ii) Next pattern



Number of sticks used = 30

11. Find HCF of 28y, 35, 42 by Euclid's game.

Solution :

Here 42 > 35 > 28

By Euclid's game HCF (28, 35, 42) = HCF (28, 42–35, 42–28)
= HCF (28, 14, 7)
= HCF (14, 7, 7) = 7

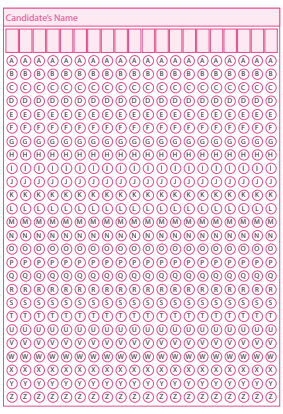
7	42, 7, 14
	6, 1, 2

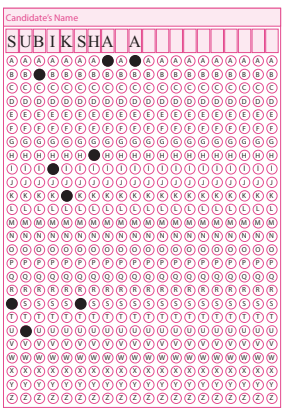
∴ HCF (28, 35, 42) = 7

12. Follow the given instructions to fill your name in the OMR sheet.

* The name should be written in capital letters from left to right.
* One alphabet is to be entered in each box.
* If any empty boxes are there at the end they should be left blank.
* Ball point pen is to be used for shading the bubbles for the corresponding alphabets.

Solution :





6th STD

III Term Summative Assessment Exam -2018-19

Reg No.

Time : 2.00 hrs **MATHS** **Maximum Marks : 60**

Section - A

I. Choose the best answer **10 × 1 = 10**

1. The reciprocal of $\frac{53}{17}$ is

(a) $\frac{53}{17}$ (b) $5\frac{3}{17}$

(c) $\frac{17}{53}$ (d) $3\frac{5}{17}$

2. If $\frac{6}{7} = \frac{A}{49}$, then the value of A is

(a) 42 (b) 36

(c) 25 (d) 48

3. The opposite of 20 units to the left of 0 is _____

(a) 20 (b) 0

(c) –20 (d) 40

4. 3 units to the left of 1 is

(a) –4 (b) –3

(c) –2 (d) 3

5. If every side of a rectangle is doubled, then its area becomes_____ times.

(a) 2 (b) 3

(c) 4 (d) 6

6. Area of a square _____

(a) 4 × S unit (b) l × b sq.un

(c) s × s sq. unit (d) $\frac{1}{2}(b \times h)$

7. Which word has a vertical line of symmetry?

(a) DAD (b) NUN

(c) MAM (d) EVE

8. The order of rotational symmetry of ★ is _____

(a) 5 (b) 6

(c) 7 (d) 8

9. The next term in the sequence 15, 17, 20, 22, 25,... is _____.

(a) 28 (b) 29

(c) 27 (d) 26

10. What will be the 25th letter in the pattern? ABCAABBCCAAABBBCCC

(a) B (b) C

(c) D (d) A

II. Fill in the blanks **5 × 1 = 5**

11. The product of a fraction and its reciprocal is always _____.

12. _____ is an integer which is neither positive nor negative.

13. 5 cm^2 = _____ mm^2

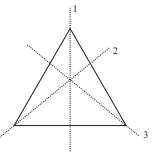
14. _____ symmetry occurs when an object slides to new position.

15. Surface occupied by a closed figure is called _____.

III. Match the following **5 × 1 = 5**

16.	Perimeter of the square	-	No line of symmetry
17.	Perimeter of the triangle	-	One line of symmetry
18.	Rectangle	-	4 × s unit
19.	Parallellogram	-	a + b + c unit
20.	Isosceles triangle	-	Two line of symmetry

ii) An equilateral triangle has three lines of symmetry.



43. Solution :

Area of rectangle = (length × breadth) units^2

Length = 40 cm

Breadth = 20 cm

$\therefore$ Area = (40 × 20) cm^2 = 800 cm^2

Area of the rectangle = 800 cm^2

Area of square = (side × side) units^2

side = 10 cm

$\therefore$ Area of square = (10 × 10) cm^2

= 100 cm^2

Required number of squares

$$= \frac{\text{Area of Rectangle}}{\text{Area of 1 square}}$$

$$= \frac{800 \text{ cm}^2}{100 \text{ cm}^2} = 8$$

8 squares can be formed.

VI.

44. Solution :

C1 : First non negative integer is 0

C3 : Second negative integer is –2 its opposite is 2

C5 : 0 is the additive identity in whole numbers

C6 : C2 has –5. Its successor is –4

C8 : Integer in C7 is –7. Predecessor of –7 is –8

C9 : C5 has 0. Opposite of 0 is 0.

C1 0	C2 –5	C3 2
C4 6	C5 0	C6 –4
C7 –7	C8 –8	C9 0

(or)

Solution :

Total area of the shaded portion = Area of a right triangle + Area of a rectangle

$= (\frac{1}{2} \times b \times h) + (l \times b)$ cm^2

$= [(\frac{1}{2} \times 3 \times 4) + (9 \times 6)]$ cm^2

= (6 + 54) cm^2 = 60 cm^2