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It gives me great pride and pleasure in bringing to you **Sura's Mathematics Full year Guide** for **I, II and III** Terms for **6th Standard**. It is prepared as per the Updated New Textbooks.

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

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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.

Mr. Subash Raj, B.E., M.S.
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(iv)

TERM – I

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TERM - I

CHAPTER
01

NUMBERS

NUMBERS HELP US TO COUNT CONCRETE OBJECTS.

Formation of Smallest and Greatest Numbers:
Ascending Order:

1. It means arrangement from the smallest to the greatest numbers.

2. For the smallest number, we arrange the given digits in ascending order.

    (e.g.) The smallest four digit number using the digits 5, 7, 8, 3 is 3578.

3. Suppose the digits given may be 5, 7, 8, 0 then arranging the digits in ascending order we get the smallest number as 0578. But leftmost zero has no value and it becomes the three digit number.

4. In this case we have to interchange the leftmost two digits to get the number

    ∴ The smallest four digit number is 5078.

Descending Order:

1. It means arrangement from the greatest to the smallest number.

2. For the greatest number, we arrange the digits in descending order.

    (E.g.) The greatest four digit number using the digits 2, 0, 9, 7 is 9720.

Place Value:

When a number consists of more than one digit each digit has a value depending upon its position.

(E.g.) The place value of each digit in 5432 is 5 thousands, 4 hundreds, 3 tens and 2 ones

The expanded form of 5432 is $5 \times 1000 + 4 \times 100 + 3 \times 10 + 2 \times 1$.

Place Value Chart

Indian Number System

Periods	Arab		Crores		Lakhs		Thousands		Ones		
	TA	A	TC	C	TL	L	T TH	TH	H	T	O
Indian Number System	Ten Arab	Arab	Ten Crores	Crores	Ten Lakhs	Lakhs	Ten Thousands	Thousands	Hundreds	Tens	Ones

1. The Place value increases from right to left.

2. Every digit of a number has a place value which gives the value of the digit.

3. From the right, first comma comes after 3 digits, and subsequent commas comes after every 2 digits

International Number System

Periods	Billions			Millions			Thousands			Ones		
International Number System	Hundred Billion	Ten Billion	Billion	Hundred Million	Ten Million	Million	Hundred Thousand	Ten Thousand	Thousand	Hundred	Ten	One

In International System, commas comes after every 3 digits from the right.

TRY THESE

✦ The Successor of 4576 is _____.   **[Ans: 4577]**

✦ The Predecessor of 8970 is _____.   **[Ans: 8969]**

✦ 999 + 1 equals _____.   **[Ans: 1000]**

✦ 10000 – 1 equals _____.   **[Ans: 9999]**

✦ The Predecessor of the smallest 5 digit number is_____.

[Ans: Greatest 4 digit number (9999)]

TRY THESE

1. **Give 3 examples where the number of things counted by you would be a 5 digit number or more.**

Sol: 1. Number of stars in the sky.
   2. Number of people living in Tamilnadu.
   3. Number of accidents in India in the year 2017.

2. **There are ten lakh people in a district. What would be the population of 10 such districts?**

Sol. Number of people in the district = 10,00,000

∴ Population of 10 such districts = 10,00,000 × 10 = 1,00,00,000

∴ Total population of 10 districts would be one crore.

∴ 10 lakh = 10,000 Hundreds

3. **The Government spends rupees 2 crores for education in a particular district every month. What would be its expenditure over 10 months?**

Sol. Expenditure for one month   = 2 crores.

∴ Expenditure for ten months = 2,00,00,000 × 10 = 20,00,00,000

Expenditure for 10 months = twenty crores.

TRY THESE

Complete the table

Place Value / Number	TC	C	TL	L	T TH	TH	H	T	O	Number Name
1670						1	6	7	0	Thousand Six Hundred and Seventy
47684					4	7	6	8	4	Forty Seven Thousand Six Hundred and Eighty Four
120001				1	2	0	0	0	1	One Lakh Twenty thousand one
7800500			7	8	0	0	5	0	0	Seventy Eight Lakhs Five Hundred
53409098		5	3	4	0	9	0	9	8	Five crore Thirty Four Lakhs Nine Thousand Ninety Eight
198765912	1	9	8	7	6	5	9	1	2	Nineteen crore Eighty Seven Lakhs Sixty Five Thousand Nine Hundred and twelve

TRY THESE

1. **Identify the incorrectly placed comma and rewrite correctly.**

Indian System :	**(i) 56,12,34,0,1,5**	**(ii) 9,90,03,2245**
International System :	**(i) 7,5613,4534**	**(ii) 30,30,304,040**

Sol:
Indian System:	(i) 56,12,34,015	(ii) 99,00,32,245
International System:	(ii) 756,134,534	(ii) 3,030,304,040

Activity

Take a white chart and cut into 9 equal pieces. Write different numbers on each piece. Arrange the pieces, as many times, horizontally which form different numbers. Write any five different numbers and express them in the Indian and the International System.

Sol: Activity to be done by the students themselves

TRY THESE

1. **Expand the following numbers:**
(i) 2304567

Sol: Number : 23,04,567

Expanded form : $2 \times 1000000 + 3 \times 100000 + 0 \times 10000 + 4 \times 1000 + 5 \times 100 + 6 \times 10 + 7 \times 1$

Read as : Twenty Three Lakh Four Thousand Five Hundred and Sixty Seven

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(ii) 4509888

Sol: Number : 45,09,888

Expanded form : $4 \times 1000000 + 5 \times 100000 + 0 \times 10000 + 9 \times 1000 + 8 \times 100 + 8 \times 10 + 8 \times 1$

Read as : Forty Five Lakh Nine Thousand Eight Hundred and Eighty Eight

(iii) 9553556

Sol: Number : 95,53,556

Expanded form : $9 \times 1000000 + 5 \times 100000 + 5 \times 10000 + 3 \times 1000 + 5 \times 100 + 5 \times 10 + 6 \times 1$

Read as : Ninety Five Lakh Fifty Three Thousand Five Hundred and Fifty Six

2. **Find the place value of underlined digits.**

(i) **3<u>8</u>41567**

Sol: Place value of 8 is $8 \times 1,00,000 = 8,00,000$ (Eight Lakh)

(ii) **94<u>4</u>3810**

Sol: Place value of 4 is $4 \times 10,000 = 40,000$ (Forty Thousand)

3. **Write down the numerals and place value of 5 in the numbers represented by the following number names.**

(i) **Forty Seven Lakh Thirty Eight Thousand Five Hundred Sixty One.**

(ii) **Nine Crores Eighty Two lakhs Fifty Thousand Two Hundred Forty One.**

(iii) **Nineteen Crores Fifty Seven Lakhs Sixty Thousand Three Hundred Seventy.**

Sol: (i) 47,38,561

Place value of 5 is $5 \times 100 = 500$ (Five Hundred)

(ii) 9,82,50,241

Place value of 5 is $5 \times 10000 = 50,000$ (Fifty Thousand)

(iii) 19,57,60,370

Place value of 5 is $5 \times 10,00,000 = 50,00,000$ (Fifty Lakhs)

TRY THESE

(Text book Page No.8)

1. **How many hundreds are there in 10 lakh?**

Sol:

1	0	0	0	0	0	0
TL	L	TTH	TH	H	T	O
				1	0	0

There are four places to the left of Hundred.

2. **How many lakhs are there in a million?**

Sol:

1	0	0	0	0	0	0
M	HTH	TTH	TH	H	T	O
	1	0	0	0	0	0
	L	TTH	T	HH	T	O

There is one place to the left of lakh.

3. **10 lakh candidates write the Public Exam this year. If each exam centre is allotted with 1000 candidates. How many exam centres would be needed?**

Sol. Candidates for one centre = 1000

∴ For 10 lakh candidates = $\dfrac{10,00,000}{1000}$ = 1000 centres

EXERCISE 1.1

1. **Fill in the blanks.**

(i) The smallest 7 digit number is _____ ⊗ **[Ans: 10,00,000]**

(ii) The largest 8 digit number is _____ **[Ans: 9,99,99,999]**

(iii) The place value of 5 in 7005380 is _____ **[Ans: 5 × 1000 = 5000]**

(iv) The expanded form of the number 76,70,905 is _____
[Ans: 7× 10,00,000 + 6 × 1,00,000 + 7 × 10,000 + 0 + 9 × 100 + 0 + 5 × 1 (or)
70,00,000 + 6,00,000 + 70,000 + 900+5]

2. **Say True or False.**

(i) Successor of a one digit number is always a one digit number

Hint : 9 + 1 = 10 **[Ans: False]**

(ii) Predecessor of a 3-digit number is always a 3 or 4 digit number

Hint : 100 – 1 = 99 **[Ans: False]**

(iii) In the Indian System of Numeration the number 67999037 is written as 6,79,99,037.
[Ans: True]

(iv) 88,888 = 8 × 10000 + 8 × 100 + 8 × 10 + 8 × 1 **[Ans: False]**

3. **How many ten thousands are there in the smallest 6 digit number?**

Sol: Smallest six digit number is 1,00,000

1 lakh	1	0	0	0	0	0	One lakh	$\dfrac{1,00,000}{10,000}$ = 10
	L	TTH	TH	H	T	O	Ten Thousand	
Ten Thousand		1	0	0	0	0		

1 lakh = **10** Ten Thousands

Another Method

Lakh is only one place to the left of Ten thousand

∴ 1 lakh is 10 times ten thousand

1 lakh = **10** Ten Thousands

4. **Observe the commas and write down the place value of 7.**

(i) 56,74,56,345   (ii) 567,456,345

Sol: **(i)** 56,74,56,345

Place value of 7 is 7 × 10,00,000 = 70,00,000 = Seventy Lakhs.

(ii) 567,456,345

Place value of 7 is 7 × 1,000,000 = 7,000,000 = Seven Million.

5. Write the following numbers in the International system by using commas.
(i) 347056 (ii) 7345671 (iii) 634567105 (iv) 1234567890

Sol.

		Billion	Hundred Million	Ten Million	Million	Hundred Thousand	Ten Thousand	Thousand	Hundred	Ten	One	The Number in International System
(i)	347056					3	4	7	0	5	6	347,056
(ii)	7345671				7	3	4	5	6	7	1	7,345,671
(iii)	634567105		6	3	4	5	6	7	1	0	5	634,567,105
(iv)	1234567890	1	2	3	4	5	6	7	8	9	0	1,234,567,890

6. Write the largest six digit number and put commas in the Indian and the International Systems. ⊗

Sol. The largest six digit number is 999999

Indian System

Lakh	Ten Thousand	Thousand	Hundred	Ten	One	The Number
9	9	9	9	9	9	9,99,999

International System

Hundred Thousand	Ten Thousand	Thousand	Hundred	Ten	One	The Number
9	9	9	9	9	9	999,999

7. Write the number names of the following numerals in the Indian System.
(i) 75,32,105 (ii) 9,75,63,453

Sol: (i) 75,32,105

TL	L	TTH	TH	H	T	O
7	5	3	2	1	0	5

Seventy Five Lakhs Thirty Two Thousand One Hundred and Five

(ii) 9,75,63,453

C	TL	L	TTH	TH	H	T	O
9	7	5	6	3	4	5	3

Nine crores Seventy Five Lakhs Sixty Three Thousand Four Hundred and Fifty Three.

8. **Write the number names in words using the International System**

(i) **345,678** **(ii)** **8,343,710** **(iii)** **103,456,789**

Sol: (i) 345,678

Hundred Thousand	Ten Thousand	Thousand	Hundred	Ten	One
3	4	5	6	7	8

Three Hundred and Forty Five Thousand Six Hundred and Seventy Eight

(ii) 8,343,710

Million	Hundred Thousand	Ten Thousand	Thousand	Hundred	Ten	One
8	3	4	3	7	1	0

Eight Million Three Hundred and Forty Three Thousand Seven Hundred and Ten.

(iii) 103,456,789

Hundred Million	Ten Million	Million	Hundred Thousand	Ten Thousand	Thousand	Hundred	Ten	One
1	0	3	4	5	6	7	8	9

One Hundred Three Million Four Hundred Fifty Six Thousand Seven Hundred and Eighty Nine.

9. **Write the number name in numerals.**

(i) **Two crores thirty lakhs fifty one thousand nine hundred eighty.**

Sol: 2,30,51,980

(ii) **Sixty six millions three hundred forty five thousand twenty seven.**

Sol: 66,345,027

(iii) **Seven hundred eighty nine million, two hundred thirteen thousand four hundred fifty six.**

Sol: 789,213,456

10. **Tamil Nadu has about twenty six thousand three hundred forty five square kilometre of Forest land. Write the number mentioned in the statement in the Indian System and International system.**

Sol: 26,345 Sq km.

11. **The number of employee in the Indian Railways is about 10 lakhs. Write this in the International System of numeration.**

Sol: 1,000,000 (One Million)

UNIT TEST

Time : 45 Minutes   **CHAPTER - 1**   **Marks: 25**

I.   Fill in the blanks.   **[5 × 1 = 5]**

1.   In Indian System of numeration, the number 51732123 is written, using commas as _____.

2.   The smallest four digit number with different digits is _____.

3.   Rounded off value of 2538473 to the nearest thousands is _____.

4.   1 Crore = _____ millions

5.   Place Value of 6 in 9643210 is _____.

II.   Say True or False.   **[5 × 1 = 5]**

6.   The numbers 4578, 4587, 5478, 5487 are in ascending order.

7.   All whole numbers are natural numbers.

8.   Predecessor of a 2 digit number is always a 2 digit number.

9. $716 \times 3 + 716 \times 7 = 7160$.

10.   1 has no predecessor in the whole numbers.

III.   Answer any three of the following questions :   **[3 × 2 = 6]**

11.   Write the smallest 8 digit number having four different digits.

12.   What is the place value of 7 in 674321

13.   Estimate the number 95623 to the nearest hundred.

14.   Estimate the sum (274 + 143) to the nearest hundred.

15.   Find the product of the largest 3 digit number and the largest five digit number.

16.   State the property used in each of the following

       (a) $12349 \times 0 = 0$.

       (b) $63 \times 136 + 63 \times 36 = 63 (136 + 36)$

17.   Find the product $4 \times 12995 \times 250$.

18.   Determine the sum using suitable rearrangements. $953 + 707 + 647$.

IV.   Answer any three of the following questions.   **[3 × 3 = 9]**

19.   The product of two numbers is 296784 one of them is 432. Find the other number.

20.   If 28362 people were watching a TV show. Write the people to the nearest thousand.

21.   A village consumes 40 litre of milk in morning and 50 litre of milk in the evening. If the cost of milk is ₹ 23 per litre. Find the total sell in rupees.

22.   Write the natural number and whole number which has no predecessor.

23.   Simplify $73 \times 10 \div 2 + (5 + 3 \times 0) \div 5$

CHAPTER
02
INTRODUCTION TO ALGEBRA

2.1 INTRODUCTION

Are you ready for a number game? Follow the steps below carefully:

Step 1	Step 2	Step 3	Step 4	Step 5
Think of any number	Multiply it by 2	Add 20	Divide by 2	Subtract the original number you had thought in step 1

Is your answer 10? Is it the same for all in the class? Verify it with your friend who might have started with a number other than your number. Surprised? What if you started with a fraction, say $\frac{1}{2}$ or $\frac{3}{4}$ or $\frac{4}{5}$? In this game, regardless of the number you started with, the answer will be 10.

Let us verify the game for two more numbers, say 4 and 9.

✦ If the initial number is 4,

Step 1	Step 2	Step 3	Step 4	Step 5
4	$4 \times 2 = 8$	$8 + 20 = 28$	$28 \div 2 = 14$	$14 - 4 = 10$

✦ If the initial number is 9,

Step 1	Step 2	Step 3	Step 4	Step 5
9	$9 \times 2 = 18$	$18 + 20 = 38$	$38 \div 2 = 19$	$19 - 9 = 10$

✦ So, we can say that the same will happen for other numbers too.

✦ You will find that Algebra is interesting and useful in solving problems in our daily life such as

✦ Finding the number of things to its cost.

✦ Expressing the distance covered, in terms of speed and time.

✦ Converting miles into kilometres, grams to kilograms etc.

✦ Finding the length of the barbed wire to fence a garden.

✦ Finding the area of a park.

✦ Finding the missing numbers in a sequence.

MATHEMATICS ALIVE − ALGEBRA IN REAL LIFE

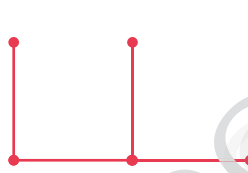| 4 sticks	8 sticks	12 sticks
4 sticks	2×4 sticks	3×4 sticks

2.2 PATTERNS

✦ We observe that 1 is odd, 2 is even, 3 is odd, 4 is even, 5 is odd and so on Thus odd numbers and even numbers alternate with each other.

✦ Let us consider the shape 'L'

We need 2 ear buds to make 1 'L' shape	We need 4 ear buds to make 2 'L' shapes	We need 6 earbuds to make 3 'L' shapes

and so on. Tabulating the above facts.

Number of 'L' shapes formed	1	2	3	4	5	. . .
Number of earbuds required	2	4	6	8	10	. . .

So the number of ear buds required is twice the number of 'L' shapes formed, i.e., Number of ear buds required = 2 × Number of 'L' shapes formed.

So we can write Number of earbuds required = $2n$, where n is the number of 'L' shapes formed.

TRY THESE

(Text book Page No.34)

✦ **Observe the following patterns and complete them**

(i)   **5, 8, 11, 14, ___, ___, ___.**

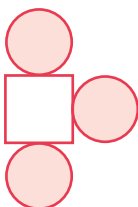**Hint :** $5 + 3 = 8, 8 + 3 = 11, 11 + 3 = 14$ **[Ans: 17, 20, 23]**

(ii)   **If 15873 × 7 = 111111 and 15873 × 14 = 222222 then, what is 15873 × 21 = ? and 15873 × 28 = ?**

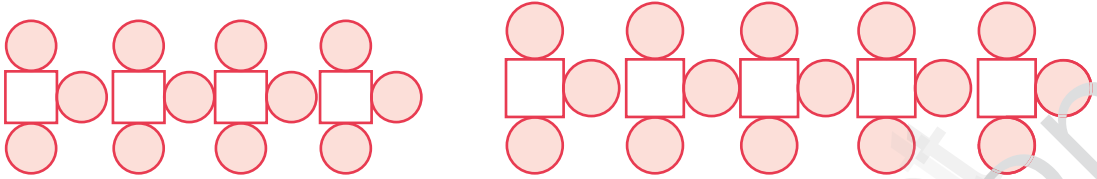**Hint :** $15873 \times 14 = 15873 \times 7 \times 2 = 111111 \times 2 = 222222$

[Ans: 15873 × 21 = 333333; 15873 × 28 = 444444]

✦ **Draw the next two patterns and complete the table.**

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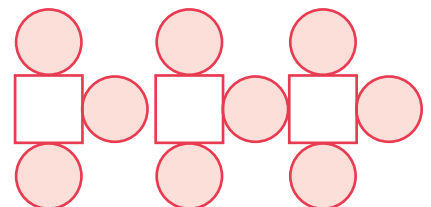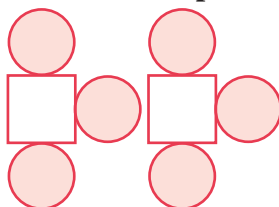
Pattern	1st	2nd	3rd	4th	5th
Squares	1	2	3		
Circles	3	6	9		

Sol: The next two patterns:

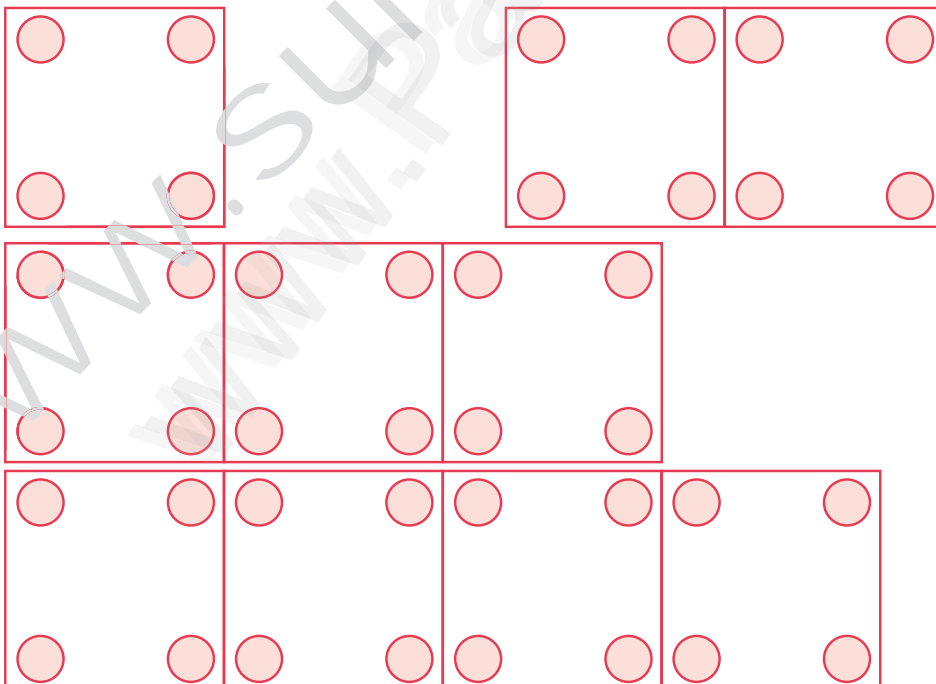| Pattern	1st	2nd	3rd	4th	5th
Squares	1	2	3	4	5
Circles	3	6	9	12	15

✦ Create your own patterns of shapes and prepare a table.

Sol: (i) Match stick pattern of triangles.
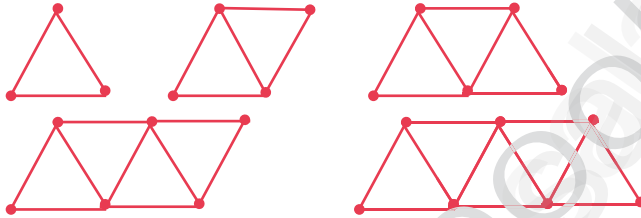
Pattern	1st	2nd	3rd	4th	5th
Triangles	1	2	3	4	5
Match sticks	3	5	7	9	11

(ii) Pattern of squares and circles.

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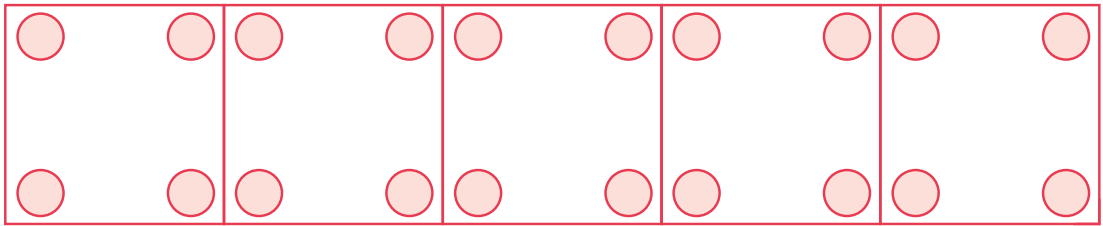
Pattern	1ˢᵗ	2ⁿᵈ	3ʳᵈ	4ᵗʰ	5ᵗʰ
Squares	1	2	3	4	5
Circles	4	8	12	16	20

2.3 UNDERSTANDING OPERATIONS ON VARIABLES

'Variable' means something that can vary. The value of the variable is not fixed. It can take different values.

✦ **Ravi and Raja are brothers, Ravi is 3 years elder than Raja. Now Raja is 11 years old. Then Ravi's age will be 11 + 3 = 14 years. After every year their ages can be tabulated using the variable '*n*'.**

Let Raja's age be '*n*'.

Raja's age	Ravi's age ($n + 3$)
$n = 11$	14
$n = 12$	15
$n = 13$	16
$n = 14$	17
$n = 15$	18
⋮	⋮
$n = 20$	23
⋮	⋮

Then $n + 3$ gives Ravi's age.

🙌 TRY THESE   (Text book Page No.36)

1. **Use a variable to write the rule, which gives the number of ice candy sticks required to make the following patterns.**

(i) a pattern of letter C as ⊏   (ii) a pattern of letter M as Ⱶ/Ⱶ

Sol: (i) Number of sticks used for 1 '⊏' is 3.

Number of ⊏ formed	1	2	3	4	5	6	. . .
Number of ice candy sticks required	3	6	9	12	15	18	. . .
	1×3	2×3	3×3	4×3	5×3	6×3	. . .

If the number of ⊏ formed is '*n*' then

the number of ice candy sticks required = $3 \times n = 3n$.

(ii) Number of sticks used for one 'M' is 4.

Number of M's formed	1	2	3	4	5	6	. . .
Number of ice candy sticks required	4	8	12	16	20	24	. . .
	1×4	2×4	3×4	4×4	5×4	6×4	. . .

Number of ice candy sticks required = $4n$.

2.4. FRAMING ALGEBRAIC STATEMENTS

As we know variables can take different values as they have no fixed value. Then all the four basic operations of addition, subtraction, multiplication and division can be performed in the same way with variables as we do with numbers.

TRY THESE

1.

Sl. No.	Algebraic Statement	Verbal Statement
1.	$a + 5$	**5 added to *a*.**
2.	$6z - 1$	**6 times *z* from which 1 is subtracted.**
3.	$12y$	**12 multiplied by *y*.**
4.	$\dfrac{x}{6}$	**x divided by 6.**

TRY THESE

2.

Sl. No.	Verbal Statement	Algebraic Statement
1.	Seven times of '*n*' minus 5	$7n - 5$
2.	The sum of '*x*' and 4	$x + 4$
3.	3 times '*y*' is divided by 8	$\dfrac{3y}{8}$
4.	11 is multiplied by '*m*'	$11m$

2.5 SOLVING UNKNOWNS THROUGH EXAMPLES

The value of the variable in an equation, which satisfies the equation is called a "solution of an equation."

TRY THESE

1. **Find the unknown.**

(i) $37 + 43 = 43 + \boxed{37}$

(ii) $(22 + 10) + 15 = \boxed{22} + (10 + 15)$

(iii) If $7 \times 46 = 322$, then $46 \times 7 = \boxed{322}$

TRY THESE

1. Find the suitable value of '*m*' to get a sum of 9?

m	*m* + 4	Result	Is it 9? Yes/No
1.	1 + 4	5	No
2.	2 + 4	6	No
3.	3 + 4	7	No
4.	4 + 4	8	No
5.	5 + 4	9	Yes

EXERCISE 2.1

1. **Fill in the blanks:**

(i) The letters a, b, c, . . ., x, y, z are used to represent _____ . **[Ans: Variables]**

(ii) The algebraic statement of 'f' decreased by 5 is _____ . **[Ans: $f - 5$]**

(iii) The algebraic statement of 's' divided by 5 is _____ . **[Ans: $\dfrac{s}{5}$]**

(iv) If A's age is 'n' years now, 7 years ago A's age was _____ . **[Ans: $n - 7$]**

(v) If '$p - 5$' gives 12 then 'p' is _____ .

Hint : $p - 5 = 12 \Rightarrow p = 12 + 5 = 17$ **[Ans: 17]**

2. **Say True or False:**

(i) The length of part B in the pencil shown is '$a - 6$'.

Hint : Length of B is $6 - a$ **[Ans: False]**

(ii) If the cost of an 🍎 is 'x' and cost of 🍌 is ₹ 5, then the total cost of fruits is ₹ '$x + 5$'. **[Ans: True]**

(iii) 10 more to three times 'c' is '$10c + 3$'.
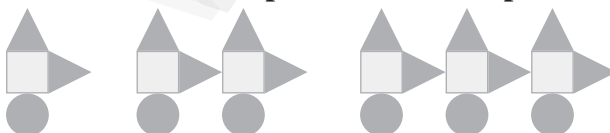
Hint : Correct answer is $3c + 10$ **[Ans: False]**

(iv) If the cost of 10 rice bags is ₹ 't' , then the cost of 1 rice bag is ₹ $\dfrac{t}{10}$. **[Ans: True]**

(v) The product of 'q' and 20 is '$20q$'. **[Ans: True]**

3. **Draw the next two patterns and complete the table.**

Shapes	1st pattern	2nd pattern	3rd pattern	4th pattern	5th pattern
Squares	1	2	3		
Circles	1	2	3		
Triangles	2	4	6		

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CHAPTER
06

INFORMATION PROCESSING

6.1 INTRODUCTION

The place in which the things are counted is fixed and arranged in some order then counting become easy, otherwise it is difficult and confusing.

For example on children's day the class teacher wanted to distribute sweets to the children of class VI. To know the number of absentees, she started counting. But it was confusing, as the students were dancing, running and enjoying the day inside the classroom. So she made the students to sit in the benches. Every bench 3 students were made to sit. They occupied 12 benches and one student was standing. Now the teacher calculated $(12 \times 3) + 1 = 37$ students were present and 3 were absent.

This suggests that the things should be in order if it is needed to be counted easily.

Example 1: How many triangles are their in the following figure. Also find the sum of the numbers given.
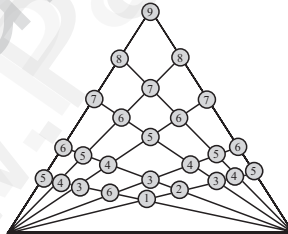
Sol. We order the small triangles for counting.
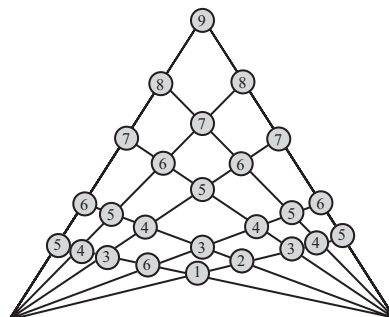
Number of Triangles:	Sum is
Δ with Vertex 1 ⟹ 1	$1 \times 1 = 1$
Δ with Vertex 2 ⟹ 2	$2 \times 2 = 4$
Δ with Vertex 3 ⟹ 3	$3 \times 3 = 9$
Δ with Vertex 4 ⟹ 4	$4 \times 4 = 16$
Δ with Vertex 5 ⟹ 5	$5 \times 5 = 25$
Δ with Vertex 6 ⟹ 4	$6 \times 4 = 24$
Δ with Vertex 7 ⟹ 3	$7 \times 3 = 21$
Δ with Vertex 8 ⟹ 2	$8 \times 2 = 16$
Δ with Vertex 9 ⟹ 1	$9 \times 1 = 9$
Number of Δ = 25	125

Sum = 125
Number of triangles = 25

6.2 SYSTEMATIC LISTING

Systematic listing means listing all possible results for a given task in a systematic manner. It is only practical for fairly short tasks. This can be understood through the following examples.

Example 2: There are two shorts and three shirts. In how many different combinations can you wear them?

Sol. Let the two shorts be denoted by A and B, the shirts be denoted by *a*, *b*, and *c*.

  Step (1) To find the different combinations first fix the shorts A and B.

A B

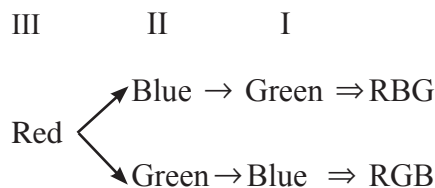 **Step (2)** Next combine all three shirts with each shorts.

i.e A $\nearrow$ *a* $\rightarrow$ *b* $\searrow$ *c*   B $\nearrow$ *a* $\rightarrow$ *b* $\searrow$ *c*

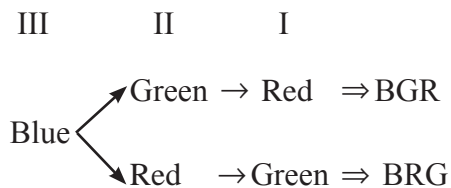 ∴ The combinations are A*a*, A*b*, A*c*, B*a*, B*b*, B*c*. So we can wear them in **six** different ways.

Example 3: Your friend has built a house with three floors. He wants to paint each floor with three different colours red, blue and green. Can you help him to find different ways of possible colour combinations to paint the home?

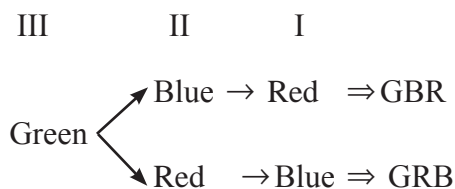**Sol.** Here there are 3 floors and 3 colours to paint.

  Step (1) Fix red colour for 3rd floor, then II and I floor will be painted Green and Blue as follows:

III   II   I

Red $\nearrow$ Blue → Green ⟹ RBG
$\searrow$ Green → Blue ⟹ RGB

Step (2)   Fix Blue for third floor, then

III   II   I

Blue $\langle$ Green → Red ⇒ BGR
                Red → Green ⇒ BRG

Step (3) Fix Green for III floor.

III   II   I

Green $\langle$ Blue → Red ⇒ GBR
                Red → Blue ⇒ GRB

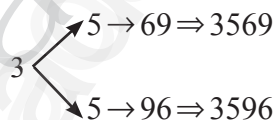∴ We get the different 6 ways for painting as RBG, RGB, BGR, BRG, GBR, and GRB.

Example 4: Suppose you want to write four digit numbers using the digits 3, 6, 9, and 5. What are the possible numbers you can write using each digit exactly once.

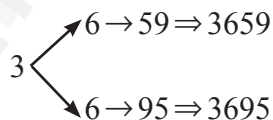*Sol.*   The numbers given are 3, 5, 6, 9.

Also give the digits not to be repeated.

Step (1) First fix 3 for thousands place and the numbers left are 5, 6, and 9.
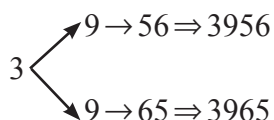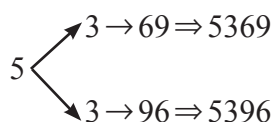
(a)   Fix 5 for hundreds place we get

$$3 \langle \begin{array}{c} 5 \to 69 \Rightarrow 3569 \\ 5 \to 96 \Rightarrow 3596 \end{array}$$

(b)   Fix 6 for hundreds place we get

$$3 \langle \begin{array}{c} 6 \to 59 \Rightarrow 3659 \\ 6 \to 95 \Rightarrow 3695 \end{array}$$

(c)   Fix 9 for hundreds place we get

$$3 \langle \begin{array}{c} 9 \to 56 \Rightarrow 3956 \\ 9 \to 65 \Rightarrow 3965 \end{array}$$
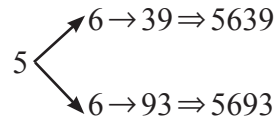
Step (2) Fix 5 for thousands place the numbers left are 9, 6, and 3.

(d)   Fix 3 for hundreds place we get

$$5 \langle \begin{array}{c} 3 \to 69 \Rightarrow 5369 \\ 3 \to 96 \Rightarrow 5396 \end{array}$$

(e)   Fix 6 for hundreds place we get

$$5 \begin{cases} 6 \to 39 \Rightarrow 5639 \\ 6 \to 93 \Rightarrow 5693 \end{cases}$$

(f)   Fix 9 for hundreds place we get

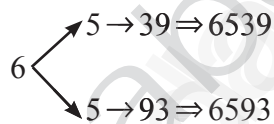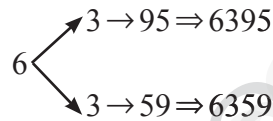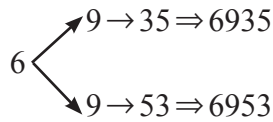$$5 \begin{cases} 9 \to 36 \Rightarrow 5936 \\ 9 \to 63 \Rightarrow 5963 \end{cases}$$
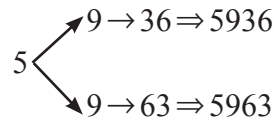
Step (3) Fix 6 for thousands place, we get

$$6 \begin{cases} 9 \to 35 \Rightarrow 6935 \\ 9 \to 53 \Rightarrow 6953 \end{cases}$$

$$6 \begin{cases} 3 \to 95 \Rightarrow 6395 \\ 3 \to 59 \Rightarrow 6359 \end{cases}$$

$$6 \begin{cases} 5 \to 39 \Rightarrow 6539 \\ 5 \to 93 \Rightarrow 6593 \end{cases}$$

Step (4) Fix 9 for thousands place, we get

$$9 \begin{cases} 6 \to 35 \Rightarrow 9635 \\ 6 \to 53 \Rightarrow 9653 \end{cases}$$

$$9 \begin{cases} 5 \to 36 \Rightarrow 9536 \\ 5 \to 63 \Rightarrow 9563 \end{cases}$$

$$9 \begin{cases} 3 \to 65 \Rightarrow 9365 \\ 3 \to 56 \Rightarrow 9356 \end{cases}$$
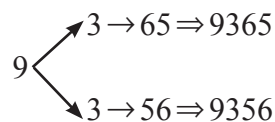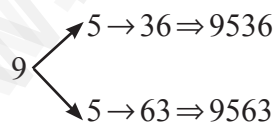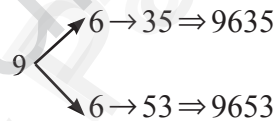
Hence we write 24 numbers as follows.

3569	3596	3659	3695	3956	3965
5369	5396	5639	5693	5936	5963
6935	6953	6395	6359	6539	6593
9635	9653	9536	9563	9365	9356

K | **COMMON FIRST TERM SUMMATIVE EXAMINATION - 2019**

STANDARD - VI

Reg. No.

Time : 2.00 Hours

MATHEMATICS

Marks : 60

Part - A

I. **Choose the correct answer :**

$5 \times 1 = 5$

1. $(53 \times 49) \times 0$ is
   a) 102
   b) 0
   c) 1
   d) $53 + 49 \times 0$

2. 6 less to n gives 8 is presented as
   a) $n - 6 = 8$
   b) $6 - n = 8$
   c) $8 - n = 6$
   d) $n - 8 = 6$

3. If $7 : 5$ is in proportion to $x : 25$, then x is
   a) 27   b) 49   c) 35   d) 14

4. A line segment is denoted as
   a) AB   b) $\overrightarrow{AB}$ c) $\overleftrightarrow{AB}$ d) $\overline{AB}$

5. The plural form of 'datum' is
   a) datum
   b) datums
   c) data
   d) datas

II. **Say true or false :**

$5 \times 1 = 5$

6. $40 + (56 - 6) \div 2 = 45$

7. If there are 11 players in a team, then there will be $11 + q$ players in q teams.

8. The ratio of 130 cm to 1 m is 13:10

9. $88°$ and $12°$ are complementary.

10. A pictograph is also known as pictogram.

III. **Match the following :**

$5 \times 1 = 5$

11. The smallest whole number — 3 : 4

12. 4 times q — Data

13. $15 : 20$ — $90°$

14. Right angle is — $4q$

15. The collected information is — 0

IV. **Fill in the blanks :**

$5 \times 1 = 5$

16. The nearest 100 of 843 is _____.

17. The P –5 gives 12 then P is _____.

18. If the cost of 3 pens is Rs. 18, then the cost of 5 pens is _____.

19. When three points lie on a line, they are said to be _____.

20. The spaces between any two bars in a bar graph _____.

Part - B

V. **Answer any 10 questions :**

$10 \times 2 = 20$

21. Write down the place value of 7
    56, 74, 56, 345

22. Arrange the following numbers in the descending order
    128435, 10835, 21354, 6348, 25840

23. Cheran had a bank savings of Rs. 7,50,250. He withdraw Rs. 5,34,500 for educational purpose. Find the balance amount in his account.

24. Express the algebraic statement $5n - 12$ into verbal statement.

25. If n takes the value 3, then find the value of $n + 10$

26. If U is an even number, how would you represent
    i)   The next even number
    ii) The previous even number

27. Madhavi and Anbu bought two tables for Rs. 750 and Rs. 900 respectively. What is the ratio of the prices of tables bought by Anbu and Madhavi.

28. Divide 20 in the ratio 3 : 2

29. Using the numbers 3, 9, 4, 12 write two ratios that are in proportion.

30. If a person reads 20 pages of a book in 2 hours, how many pages will he read in 8 hours at the same speed?

31. From the given figure. Identify the parallel lines
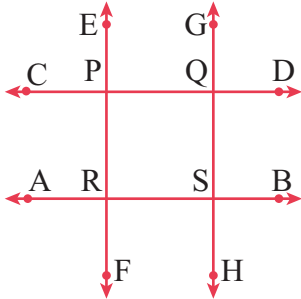
32. Draw and label ∠BIG = 35°

33. Viji threw a die 30 times and noted down the result each time follows. Prepare a table on the number shown using Tally marks.

1	4	3	5	5	6	6	4	3	5	4	5	6	5	2
4	2	6	5	5	6	6	4	5	6	6	5	4	1	1

34. How many triangles are there in the figure.
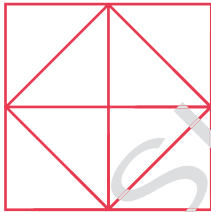
35. Draw a bar graph for this data.

Classes	VI	VII	VIII	IX	X
Number of laddus	70	60	45	80	55

Part - C

VI. Answer any 5 questions : 5 × 3 = 15

36. Estimate the sum of 157826 and 32469 rounded off to the nearest ten thousand.

37. A poultry has produced 15472 eggs and fits 30 eggs in a tray. How many trays do they need?

38. A piece of wire is 12 s cm long. What will be the length of the side if it is formed as

i) An equilateral triangle

ii) A square

39. Kumaran has Rs. 600 and wants to divide it between Vimala and Yazhini in the ratio 2:3. Who will get more and how much?

40. From the figure,

i) Name a pair of complementary angles

ii) Name a pair of supplementary angles
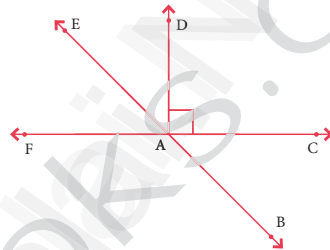
41. Draw a pictograph for the given data.

Month	June	July	Aug.	Sep.
No. of computers	300	450	600	550

42. In the following magic triangle, arrange the numbers from 1 to 6 so that you get the same sum on all its sides.
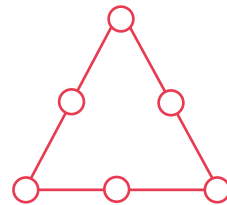
43. Observe the diagram and fill in the blanks.

i) A, O and B are _____ points.

ii) A, B and C are _____ points.

iii) _____ is the point of concurrency.

Part - D

VII. Answer any one of the following : $1 \times 5 = 5$

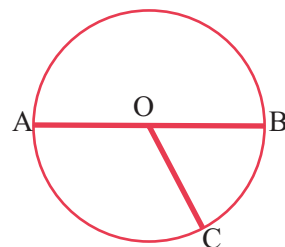44. Construct a line segment using ruler and compass : $\overline{AB}$ = 7.5 cm (or)

45. Draw the angle 135° using the protractor.

☆ ☆ ☆

Answer

Part - A

I. 1. b) 0
    2. a) $n - 6 = 8$
    3. c) 35
    4. d) $\overline{AB}$
    5. c) data

II. 6. False
    Hint : $40 + 50 \div 2 = 40 + 25 = 65$
    7. False
    Hint : There will be $11q$ players.
    8. True
    9. False
    Hint : $88º + 180º = 260º \neq 1$
    10. True

III. 11. The smallest whole number - 0
    12. 4 times q - $4q$
    13. 15 : 20 - 3 : 4
    14. Right angle is - 90°
    15. The collected information is - Data

IV. 16. 800
    Hint : The digit in tens place is $4 < 5$.
    17. 17
    18. ₹30
    Hint : $5 \times \dfrac{18}{3} = 5 \times 6 = $ ₹30
    19. When three points lie on a line, they are said to be **collinear.**
    20. The spaces between any two bars in a bar graph **are the same.**

Part - B

V.
21. 56, 74, 56, 345
    Place value of 7 is $7 \times 10,00,000$
    $= 70,00,000$
    = Seventy Lakhs.

22. Place value chart is given by

Qn. No.	Given Number	L	T TH	TH	H	T	O
(i)	128435	1	2	8	4	3	5
(ii)	10835		1	0	8	3	5
(iii)	21354		2	1	3	5	4
(iv)	6348			6	3	4	8
(v)	25840		2	5	8	4	0

⇒ The number with more digits is the greater number

Step 1: ∴ 128435 is the larger number and 6348 is the least number

Step 2: For the remaining 5 digit numbers we can compare the left most digits and find $25840 > 21354 > 10835$

∴ The descending order:
$128435 > 25840 > 21354 > 10835 > 6348$

23. Bank Savings of Cheran = ₹ 7,50,250
    Withdrew Amount = ₹ 5,34,500
    ∴ Balance Amount = ₹ 2,15,750

24. 12 less to 5 times n.

25. Given n = 3
    then $n+10$ = $3 + 10 = 13$
    $n + 10$ = 13

26. (i) Difference between two even numbers = 2
    Given that 'u' is an even number. Next even number is $u + 2$.
    (ii) Previous even number is $u - 2$.

27. Ratio $= \dfrac{900}{750} = \dfrac{90}{75} = \dfrac{18}{15} = \dfrac{6}{5} = 6:5$

28. 20 in the ratio 3 : 2. Dividing 20 into
    $3 + 2 = 5$ equal parts, then $20 \times \dfrac{3}{5} = 12$
    $20 \times \dfrac{2}{5} = 8$
    ∴ The required answer is 12, 8

TERM – II

CONTENTS

TERM - II

CHAPTER
01

NUMBERS

✦ A number which cannot be divided equally into groups of two are called odd numbers. All odd numbers end with anyone of the digits 1, 3, 5, 7 or 9.

✦ A number which can be divided equally into groups of two are called even number. All even numbers end with any one of the digits 0, 2, 4, 6 or 8.

✦ Odd and even numbers come alternatively.

✦ The sum of any two odd numbers is always an even number.

✦ The sum of an odd number and an even number is always an odd number.

✦ The product of any two odd numbers is always an odd number.

✦ The product of an odd end an even number is always an even number.

✦ The product of three odd numbers is always an odd number.

✦ 1 is the first odd natural number and 0 is the first even whole number.

✦ 1 is odd and its successor 2 is even and so the predecessor of 1 is 0 and 0 is even

✦ A factor is a number that divides the given number exactly (gives remainder zero).

✦ Every factor of a number is less than or equal to that number.

✦ Every multiple of a number is greater than or equal to that number.

✦ Multiples of a number are endless.

1.2. PRIME AND COMPOSITE NUMBERS

✦ A natural number greater than 1, having only two factors namely 1 and the number itself is called a prime number.

✦ A natural number having more than 2 factors is called a composite number.

✦ A number is a **perfect number** if the sum of its factors except that number gives the number. Eg : 6. Since sum of its factors other than 6 is $1 + 2 + 3 = 6$.

✦ Total number of primes upto 100 is 25.

✦ The only prime number which ends with 5 is 5.

✦ Composite numbers have at least 3 factors

✦ A pair of prime numbers, whose difference is exactly 2 is called twin primes. Eg (3, 5)

✦ If three successive prime numbers differ by 2, then they form a prime triplet. The only prime triplet that exists is 3, 5 and 7.

1.3. RULES FOR DIVISIBILITY OF NUMBERS.

✦ A number is divisible by 2, if its ones place is any one of the even numbers 2, 4, 6, 8 and 0.

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

✦ Eg: In 36, sum of digits = 3 + 6 = 9

9 is divisible by 3.

∴ 36 is divisible by 3.

✦ The sum of any three consecutive numbers is divisible by 3.
  Eg : $2 + 3 + 4 = 9$, 9 is divisible by 3.

✦ A number is divisible by 5 if its ones place is either 0 or 5.
  Eg : 50 and 25 are divisible by 5.

✦ A number is divisible by 10 if its ones place is zero.
  Eg : 20

✦ The numbers divisible by 10 are also divisible by 5.

✦ A number is divisible by 4 if the last two digits of the number are divisible by 4. Also if last two digits are zero, then that number also divisible by 4.
  Eg : 2900 , 2040 are divisible by 4.

✦ A number is divisible by 6, if it is divisible by both 2 and 3.
  Eg : 138 is divisible by 6.

✦ A number is divisible by 8 if its last three digits are either 0 or divisible by 8.
  Eg : 3000 and 9824 are divisible by 8.

✦ A number is divisible by 9 if the sum of its digits is divisible by 9.
  Eg: In 927 the sum of digits   = $9 + 2 + 7 = 18$
  Again $1 + 8 = 9$, divisible by 9.
  $\therefore$ 927 is divisible by 9.

✦ A number is divisible by 11 if the difference between the sum of the digits at odd and even places (from the right) of the number is either 0 or divisible by 11.

1.4. PRIME FACTORISATION:

Expressing a given number as a product of factors that are all prime numbers is called the prime factorisation of a number.

TRY THESE

(Text book Page No.1)

(i) **Observe and complete:**
$$1 + 3 \quad = \; ?$$
$$5 + 11 \quad = \; ?$$
$$21 + 47 \quad = \; ?$$
$$\_\_\_ + \_\_\_ \quad = \; ?$$

From this observation, we conclude that "the sum of any two odd numbers is always an_____"

Ans:
$$1 + 3 \quad = \; 4$$
$$5 + 11 \quad = \; 16$$
$$21 + 47 \quad = \; 68$$

An odd number + **another odd number** = **An Even number**
From this observation, we conclude that the sum of any two odd numbers is always an even number.

(ii) **Observe and complete:**
$$5 \times 3 \quad = \; ?$$
$$7 \times 9 \quad = \; ?$$
$$11 \times 13 \quad = \; ?$$
$$\_\_\_ \times \_\_\_ \quad = \; ?$$

From this observation, we conclude that "the product of any two odd numbers is always an ____".

Ans:

$$5 \times 3 = 15$$
$$7 \times 9 = 63$$
$$11 \times 13 = 143$$

An odd number $\times$ Another odd number = An odd number

From this observation, we conclude that "the product of any two odd numbers is always an odd number.

Justify the following statements with appropriate examples:

(iii) **The sum of an odd and an even number is always an odd number.**

Ans: Take the odd number 5 and

the even number 10

Their sum $= 5 + 10 = 15$, which is odd.

$\therefore$ Sum of an odd number and an even number is always an odd number.

(iv) **The product of an odd and an even number is always an even number.**

Ans: Take the odd number 5 and

the even number 10.

Their product $= 5 \times 10 = 50$, which is even

Thus the product of an odd and an even number is always an even number.

(v) **The product of any three odd numbers is always an odd number.**

Ans: Consider $7 \times 5 \times 3$

We know that the product of any two odd numbers is an odd number

$7 \times 5 = 35$, odd number.

Also we have $35 \times 3 = 105$

$\therefore$ $7 \times 5 \times 3 = 105$, an odd number.

So the product of three odd numbers is always an odd number.

🙌 TRY THESE

(Text book Page No.3)

1. **(i)** **Say True or False**

(a) The smallest odd natural number is 1. **[Ans: True]**

(b) 2 is the smallest even whole number. **[Ans: False]**

(c) $12345 + 5063$ is an odd number. **[Ans: False]**

(d) Every number is a factor of itself. **[Ans: True]**

(e) A number which is a multiple of 6 is also a multiple of 2 and 3. **[Ans: True]**

(ii) **Is 7, a factors of 27 ?**

Ans: No, 7 is not a factor of 27. Because 7 does not divide 27 exactly

(iii) Is 12, a factor or a multiple of 12 ?

Ans: 12 is both a factor and a multiple of 12

(iv) Is 30, a factor or a multiple of 10?

Ans: 30 is a multiple of 10

(v) Which of the following numbers has 3 as a factor ?

(a) 8   (b) 10   (c) 12   (d) 14

Ans: (a) Factors of 8 are 1, 2, 4, 8

(b) Factors of 10 are 1,2, 5,10

(c) Factors of 12 are 1, 2, 3, 4, 6, 12

(d) Factors of 14 are 1, 2, 7, 14

$\therefore$ The number 12 has 3 as a factor

(vi) **The factors of 24 are 1, 2, 3, ◇, 6, ◇, 12 and 24. Find the missing ones.**

Ans: Factors of 24 are 1, 2, 3, 4, 6, 8, 12, 24.

Missing Factors : 4, 8.

(vii) **Look at the following numbers carefully and find the missing multiples.**

9	4		8	27			16	45			24

Ans:

9	4	18	8	27	12	36	16	45	20	54	24

TRY THESE

(i) **Express 68 and 128 as the sum of two consecutive primes.**

Ans:
$$68 = 31 + 37$$
$$128 = 61 + 67$$

(ii) **Express 79 and 104 as the sum of any three primes.**

Ans:
$$79 = 37 + 31 + 11$$
$$79 = 41 + 31 + 7$$
$$79 = 61 + 11 + 7$$
$$79 = 59 + 13 + 7$$
$$79 = 53 + 19 + 7 \text{ and so on.}$$

104 cannot be expressed as the sum of three odd primes.

Because we know that " the sum of any two odd numbers is an even number".

Also the sum of an odd and even number is always an odd number.

$$\therefore 104 = 61 + 41 + 2$$
$$104 = 97 + 5 + 2$$
$$104 = 89 + 13 + 2 \text{ and so on.}$$

TRY THESE

(i) **Are the leap years divisible by 2?**

Ans: Leap years are divisible by 4.

∴ Leap years are divisible by 2.

(ii) **Is the first 4 digit number divisible by 3 ?**

Ans: The first four digit number is 1000.

Sum of the digits is $1 + 0 + 0 + 0 = 1$, not divisible by 3.

∴ 1000 is not divisible by 3.

(iii) **Is your date of birth (DDMMYYYY) divisible by 3 ?**

Ans: Date of birth 25.05.2007

Sum of digits $= 2 + 5 + 0 + 5 + 2 + 0 + 0 + 7 = 21$

Again $2 + 1 = 3$, divisible by 3.

∴ My date of birth is divisible by 3.

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(iv)   Check whether, the sum of 5 consecutive numbers is divisible by 5.

Ans: Take the first five consecutive natural numbers 1, 2, 3, 4 and 5.

Their sum $1 + 2 + 3 + 4 + 5$ = 15, divisible by 5.

Also, $2 + 3 + 4 + 5 + 6$ = 20, divisible by 5.

$3 + 4 + 5 + 6 + 7$ = 25, divisible by 5.

Generally the sum of 5 consecutive natural numbers is divisible by 5.

(v)   Identify the numbers in the sequence 2000, 2006, 2010, 2015, 2019, 2025 that are divisible by both 2 and 5.

Ans: We know that a number is divisible by both 2 and 5 if it is divisible by 10. 2000 and 2010 are divisible by 10.

Activity

(Textbook Page No.9)

The teacher may ask all the students to check mentally for divisibility by 2, 3, 4, 5, 6, 8, 9,10 and 11. If divisible, let them write 'yes', otherwise 'no'(the first one is done for you!).

Sol:

Number	÷ 2	÷ 3	÷ 4	÷ 5	÷ 6	÷ 8	÷ 9	÷ 10	÷ 11
68	Yes	No	Yes	No	No	No	No	No	No
99	No	Yes	No	No	No	No	Yes	No	Yes
300	Yes	Yes	Yes	Yes	Yes	No	No	Yes	No
495	No	Yes	No	Yes	No	No	Yes	No	Yes
1260	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No
7920	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
11880	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
13650	Yes	Yes	No	Yes	Yes	Yes	No	Yes	No
600600	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
15081947	No	No	No	No	No	No	No	No	No

EXERCISE 1.1

1.   Fill in the blanks.

(i)   The number of prime numbers between 11 and 60 is _____.   **[Ans: 12]**

(ii)   The numbers 29 and _____ are twin primes.   **[Ans: 31]**

(iii)   3753 is divisible by 9 and hence divisible by _____.   **[Ans: 3]**

(iv)   The number of distinct prime factors of the smallest 4 digit number is _____.

[Ans: 2]

(v)   The sum of distinct prime factors of 30 is _____.   **[Ans: 10]**

2.   Say True or False.

(i)   The sum of any number of odd numbers is always even.   **[Ans: False]**

(ii)   Every natural number is either prime or composite.   **[Ans: False]**

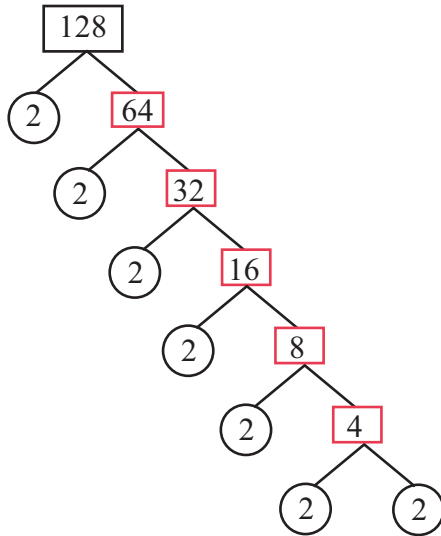(iii)   If a number is divisible by 6, then it must be divisible by 3.   **[Ans: True]**

(iv)   16254 is divisible by 2,3,6 and 9.   **[Ans: True]**

(v)   The number of distinct prime factors of 105 is 3.   **[Ans: True]**

3. **Write the smallest and the biggest two digit prime number.**

Ans: Smallest is : 11   Biggest is : 97

4. **Write the smallest and the biggest three digit composite number.**

Ans: Smallest three digit number = 100, divisible by 2,4,5,10,20,25,50 and so it is composite
Biggest three digit number is 999, divisible by 3, 9 and so it is composite.
∴ Smallest is 100   Biggest is 999

5. **The sum of any three odd natural numbers is odd. Justify this statement with an example.**

Ans: True, as we know, that," the sum of any three odd numbers is always an odd number".
Example : $3 + 7 + 9 = 19$ is odd.

6. **The digits of the prime number 13 can be reversed to get another prime number 31. Find if any such pair exists upto 100.**

Ans: The required pairs are

(i) 17 and 71   (ii) 37 and 73   (iii) 79 and 97

7. **Your friend says that every odd number is prime. Give an example to prove him/her wrong.**

Ans: 15 is an odd number but not prime number.

8. **Each of the composite numbers has atleast three factors. Justify this statement with an example.**

Ans: Factors of 4 are 1, 2, 4

9. **Find the dates of any month of a calendar which are divisible by both 2 and 3.**

Ans: Every month the dates 6,12,18,24 and 30 (excluding February) are divisible by both 2 and 3.

10. **I am a two digit prime number and the sum of my digits is 10. I am also one of the factors of 57. Who am I ?**

Ans: Two digit prime numbers with sum of digits 10 are : 19,37,73. Of these factors of 57 is 19.
∴ The number is 19.

11. **Find the prime factorisation of each number by factor tree method and division method.**

(a) 60   (b) 128   (c) 144   (d) 198
(e) 420   (f) 999

Ans: (a)   60   Also

∴ $60 = 2 \times 2 \times 3 \times 5$.

2	60
2	30
3	15
5	5
	1

∴ $60 = 2 \times 2 \times 3 \times 5$.

(b)   128

Also

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

$128 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2$

$\therefore 128 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2$

(c)   144
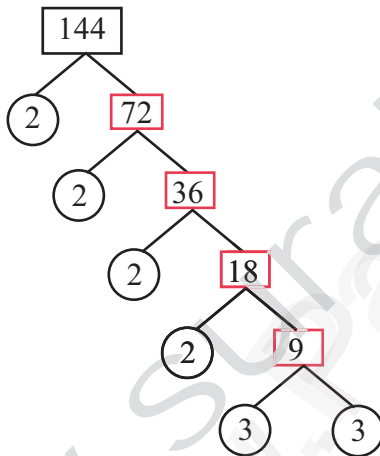
Also

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

$\therefore 144 = 2 \times 2 \times 2 \times 2 \times 3 \times 3.$

$\therefore 144 = 2 \times 2 \times 2 \times 2 \times 3 \times 3.$

(d)   198
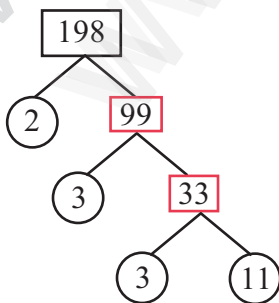
Also

2	198
3	99
3	33
11	11
	1

$198 = 2 \times 3 \times 3 \times 11$

$198 = 2 \times 3 \times 3 \times 11$

(e)   420
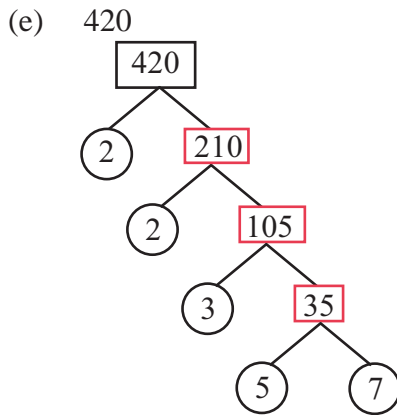
Again

2	420
2	210
3	105
5	35
7	7
	1

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

(f)   999
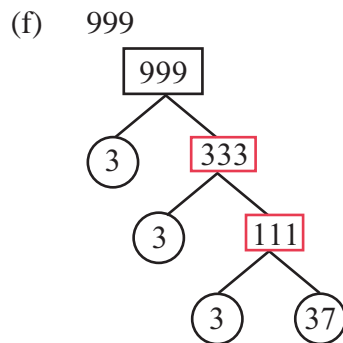
$999 = 3 \times 3 \times 3 \times 37$

Again

3	999
3	333
3	111
37	37
	1

$999 = 3 \times 3 \times 3 \times 37$

12. **If there are 143 math books to be arranged in equal numbers in all the stacks, then find the number of books in each stack and also the number of stacks.**

Ans: Total number of books = 143

11	143
13	13
	1

Factorizing

$143 = 11 \times 13$

Number of stacks and number of books in each stack may be (11,13) or (13,11).

OBJECTIVE TYPE QUESTIONS

13. **The difference between two successive odd numbers is**   ⊗
   (a)   1   (b)   2   (c)   3   (d)   0   **[Ans: (b) 2]**
14. **The only even prime number is**
   (a)   4   (b)   6   (c)   2   (d   0   **[Ans: (c) 2]**
15. **Which of the following numbers is not a prime ?**
   (a)   53   (b)   92   (c)   97   (d)   71   **[Ans: (b) 92]**
16. **The sum of the factors of 27 is**
   (a)   28   (b)   37   (c)   40   (d)   31   **[Ans: (c) 40]**
17. **The factors of a number are 1,2,4,5,8,10,16,20,40 and 80. What is the number?**
   (a)   80   (b)   100   (c)   128   (d)   160   **[Ans: (a) 80]**

CHAPTER
04

GEOMETRY

✦ To form a closed figure we need atleast 3 sides.

✦ A three sided closed plane figure is called a triangle.

✦ It can be represented as ΔABC if the vertices are A, B and C.

✦ The point of intersection of two sides of the triangle is called vertex .
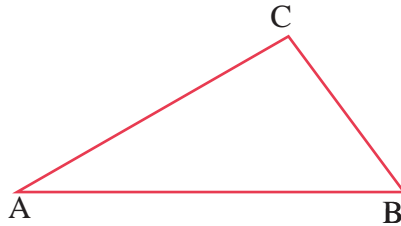
✦ Here ΔABC has angles ∠ABC, ∠BCA and ∠CAB.

✦ $\overline{AB}$, $\overline{BC}$ and $\overline{CA}$ are the sides of the triangles.

✦ A triangle has 3 sides, 3 angles and 3 vertices.

PROPERTIES OF TRIANGLES

✦ If the measure of all angles are different then all sides are also different .

✦ If the measure of two angles are equal, then two sides are also equal.

✦ If the measure of three angles are equal, then three sides are also equal and each angle measures 60°.

✦ Sum of the three angles of a triangle is 180°.

✦ Based on the sides of a triangle it can be classified into three kinds. They are Equilateral triangle, Isosceles triangle and Scalene triangle.

✦ If three sides of a triangle are equal in length then it is called an Equilateral triangle.

✦ If two sides of a triangle are in equal length then it is called Isosceles Triangle.

✦ If three sides of triangle are different in lengths, then it is called a scalene triangle.

✦ Based on the angles of a triangle it can be classified into 3 kinds as acute angled triangle, obtuse angled triangle and right angled triangle.

✦ If three angles of a triangle are acute angles (between 0° and 90°) then it is called an acute angled triangle.

✦ If an angle of a triangle is right angle (90°) then it is called a right angled triangle.

✦ If an angle of a triangle is an obtuse angle (between 90° and 180°) then it is called an obtuse angled triangle.

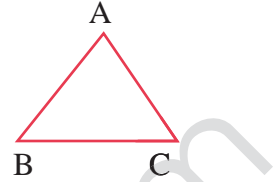✦ A triangle can have three acute angles but cannot have more than one right angle or an obtuse angle.

[219]

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TRIANGLE INEQUALITY:-

✦ In a triangle, the sum of any two sides of a triangle is greater than the third side (Triangle Inequality)

    ie AB + BC > CA

      BC + CA > AB

      CA + AB > BC

✦ If the three sides are in equal length then definitely a triangle can be formed.

✦ If two sides of the triangle are given, then the length of the third side of the triangle will lie between the difference and sum of the lengths of two given sides.

✦ The distance between a set of parallel lines remains the same.

✦ The set squares are two triangle shaped instruments in the Geometry Box.

✦ Each of them has a right angle .

✦ Parallel line segments need not be of equal length.

TRY THESE

Complete the following table. In any triangle.

Sl.No	Side 1	Side 2	Side 3	Types of Triangle
1	6cm	7cm	8cm	Scalene Triangle
2	5cm	5cm	5cm	Equilateral Triangle
3	2.2cm	2.5cm	3.2cm	Scalene Triangle
4	7cm	7cm	10cm	Isosceles Triangle
5	10cm	10cm	10cm	Equilateral Triangle
6	10 cm	8cm	8cm	Isosceles Triangle

TRY THESE

Complete the table.

S.No	∠A	∠B	∠C	Sum of three angles	Can a △ABC be formed	Type of triangle
1	60°	60°	60°	180°	Yes	Acute angled triangle
2	50°	40°	90°	180°	Yes	Right angled triangle
3	60°	30°	90°	180°	Yes	Right angled triangle
4	95°	40°	35°	170°	No	–
5	110°	40°	30°	180°	Yes	Obtuse angled triangle
6	150°	60°	70°	280°	No	–

TRY THESE

Can a triangle be formed with the given sides? If yes, state the type of triangle formed.

Sl.No	$\overline{AB}$	$\overline{BC}$	$\overline{CA}$	Can a △ABC be formed	Type of triangle
1	7 cm	10 cm	6 cm	Yes	Scalene Triangle
2	10 cm	8 cm	8 cm	Yes	Isosceles Triangle
3	8.5 m	7.3 m	6.8 m	Yes	Scalene Triangle
4	4 cm	5 cm	12 cm	No	–
5	15 m	20 m	20 m	Yes	Isosceles Triangle
6	23 cm	20 cm	18 cm	Yes	Scalene Triangle
7	3.2 cm	1.5 cm	1.5 cm	No	–

EXERCISE 4.1

1.   Fill in the blanks.

(a)   Every triangles has atleast _____ acute angles.   **[Ans: two]**

(b)   A triangle in which none of the sides equal is called a _____.

[Ans: Scalene triangle]

(c)   In an isosceles triangle _____ angles are equal.   **[Ans: two]**

(d)   The sum of three angles of a triangle is _____.   ⊗ **[Ans: 180°]**

(e)   A right angled triangle with two equal sides is called _____.

[Ans: Isosceles right angled triangle]

2.   Match the following:

(i)   No sides are equal   -   Isosceles triangle
(ii)   One right angle   -   Scalene triangle
(iii)   One obtuse angle   -   Right angled triangle
(iv)   Two sides of equal length   -   Equilateral triangle
(v)   All sides are equal   -   Obtuse angled triangle

Ans: (i)   No sides are equal   -   Scalene triangle
(ii)   One right angle   -   Right angled triangle
(iii)   One obtuse angle   -   Obtuse angled triangle
(iv)   Two sides of equal length   -   Isosceles triangle
(v)   All sides are equal   -   Equilateral triangle
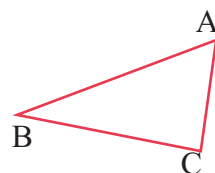
3.   In △ABC, name the

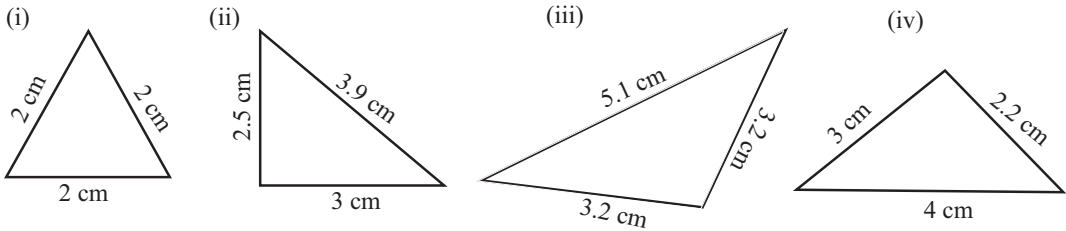(a)   Three sides: _____ , _____ , _____   **[Ans: $\overline{AB}$, $\overline{BC}$, $\overline{CA}$]**

(b)   Three Angles: _____ , _____ , _____

[Ans: ∠ABC, ∠BCA, ∠CAB or ∠A, ∠B, ∠C]

(c)   Three Vertices: _____ , _____ , _____   **[Ans: A, B, C]**

4. **Classify the given triangles based on its sides as scalene, isosceles or equilateral.**

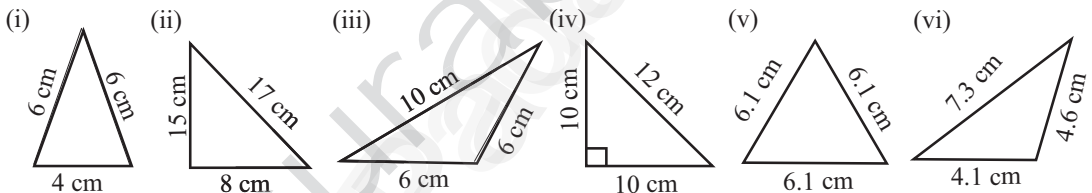(i) (ii) (iii) (iv)

Ans: (i)   Equilateral triangle   (ii)   Scalene triangle
(iii) Isosceles triangle   (iv)   Scalene triangle

5. **Classify the given triangles based on its angles as acute angled, right angled or obtuse angled.**

(i) (ii) (iii) (iv)
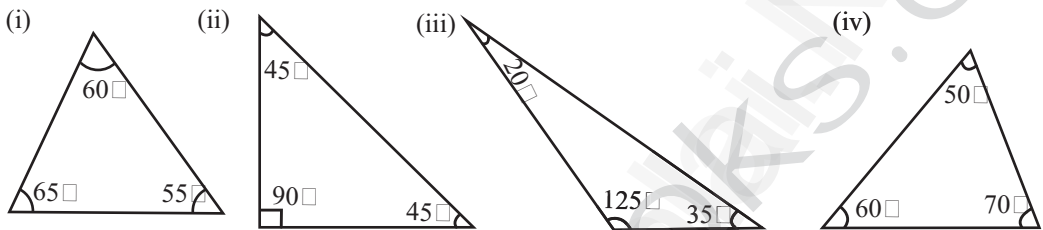
Ans: (i)   Acute angled triangle   (ii)   Right angled triangle
(iii) Obtuse angled triangle   (iv)   Acute angled triangle

6. **Classify the following triangles based on its sides and angles.**

(i) (ii) (iii) (iv) (v) (vi)

Ans: (i)   Isosceles Acute angled triangle   (ii)   Scalene Right angled triangle
(iii) Isosceles Obtuse angled triangle   (iv)   Isosceles Right angled triangle
(v)   Equilateral Acute angled triangle   (vi)   Scalene Obtuse angled triangle

7. **Can a triangle be formed with the following sides? If yes, name the type of triangle.**
(i)   8 cm, 6 cm, 4 cm   **(ii)   10 cm, 8 cm, 5 cm**
(iii) 6.2 cm, 1.3 cm, 3.5 cm   **(iv) 6 cm, 6 cm, 4 cm**
(v)   3.5 cm, 3.5 cm, 3.5 cm   **(vi) 9 cm, 4 cm, 5 cm**

Sol: **(i)   8 cm, 6 cm, 4 cm**

Sum of two smaller sides   = 6 cm + 4 cm = 10 cm

> 8 cm, third side

∴ Triangle can be formed with this sides

None of the sides is equal.

∴ Yes, it is a scalene triangle

(ii)   10cm, 8cm, 5cm.

Sum of two smaller sides   = 8 cm + 5 cm = 13 cm

> 10 cm, third side

∴ Triangle can be formed

None of the sides is equal.

∴ Yes, it is scalene triangle

(iii) 6.2 cm, 1.3 cm, 3.5 cm.

Here sum of two smaller sides = 1.3 cm + 3.5 cm = 4.8 cm

< 6.2 cm, third side

∴ No, The triangle cannot be formed

(iv) 6 cm, 6 cm, 4 cm

Sum of two smaller sides = 4 cm + 6 cm = 10 cm

> 6 cm, third side

∴ Triangle can be formed. Also two sides are equal.

∴ Yes, it is an isosceles triangle.

(v) 3.5 cm, 3.5 cm, 3.5 cm.

Here sum of two sides = 3.5 cm + 3.5 cm = 7 cm

> 3.5 cm (Third side)

∴ Triangle can be formed.

Also all the three sides are equal. ∴ Yes, it is an equilateral triangle.

(vi) 9 cm, 4 cm, 5 cm.

Sum of two smaller sides = 4 cm + 5 cm = 9 cm (the third side).

∴ No, The triangle cannot be formed.

8. **Can a triangle be formed with the following angles? if yes, name the type of triangle.**

(i) $60°, 60°, 60°$ **(ii)** $90°, 55°, 35°$

(iii) $60°, 40°, 42°$ **(iv)** $60°, 90°, 90°$

(v) $70°, 60°, 50°$ **(vi)** $100°, 50°, 30°$

Sol: **(i)** $60°, 60°, 60°.$

Sum of three angles = $60° + 60° + 60° = 180°$

Yes, a triangle can be formed.

It is Acute angled triangle.   [∵ all the angles < 90º]

(ii) $90°, 55°, 35°.$

Sum of three angles = $90° + 55° + 35° = 180°$

∴ Yes, a triangle can be formed. It is right angled triangle. [∵ one angle is 90º]

(iii) $60°, 40°, 42°.$

Sum of three angles = $60° + 40° + 42° = 142° \neq 180°$

∴ No, The triangle cannot be formed.

(iv) $60°, 90°, 90°.$

Sum of three angles = $60° + 90° + 90° = 240° \neq 180°$

∴ No, The triangle cannot be formed.

(v) $70°, 60°, 50°.$

Sum of three angles = $70° + 60° + 50° = 180°$

∴ Yes, A triangle can be formed

It is an acute angled triangle.

(vi) $100°, 50°, 30°.$

Sum of three angles = $100° + 50° + 30° = 180°$

∴ Yes, A triangle can be formed.

It is obtuse angled triangle.   [∵ one angle is > 90º]

COMMON SECOND TERM SUMMATIVE EXAMINATION – 2019 - 2020

6 STD

Standard - VI

MATHEMATICS

Reg. No.

Time : 2.00 hours

Marks : 60

PART - A

I. Choose the correct answer :

5×1= 5

1. The difference between two successive odd numbers is
a) 1   b) 2
c) 3   d) 0

2. Which of the following pairs is co-prime?
a) 51, 63   b) 52, 91
c) 71, 81   d) 81, 99

3. Which is the greatest? 0.007g, 70mg, 0.07 cg
a) 0.07 cg   b) 0.007 g
c) 70 mg   d) all are equal

4. 2½ years equal to _____ months.
a) 25   b) 30
c) 24   d) 5

5. Discount = M.P - _____.
a) Profit   b) S. P
c) Loss   d) C. P.

II. Say True or False :

5×1= 5

6. The HCF of 17 and 18 is 1.

7. Meena bought 250 ml of buttermilk which is equal to 2.5 litres.

8. Marked price = Cost price + Overhead expenses

9. Sum of the three angles in a triangle is 160º.

10. If any two sides of a triangle are equal in length, then it is called an isosceles triangle.

III. Match the following :

5×1= 5

11. 90º is   -   240 minutes
12. Profit   -   even prime number
13. 4 hours   -   1000 grams
14. 2 is an   -   Right angle
15. 1 Kg   -   Selling price – Cost Price

### IV. Fill in the blanks :

5×1= 5

16. The HCF of 45 and 75 is _____.
17. 250 ml + ½ litre = _____ litres.
18. The numbers 29 and _____ are twin primes.
19. 3 weeks = _____ days.
20. Every triangle has atleast _____ acute angles.

PART - B

V. Answer any ten questions :

10×2= 20

21. Find the prime factorisation of 60 using factor tree method.

22. Write the smallest and the biggest two digit prime number.

23. Find the LCM of 10, 15 using prime factorisation method.

24. Convert into indicated units 4 km and 300 m into m.

25. Murali has a bag that weighs 3kg and 450g. What is its weight in gram?

26. Thenmozhi's height is 1.25m how she grows 5cms every year. What would be her height after 4 years?

27. Convert 580 minutes into hours.

28. Convert 21 : 10 hours into 12 hour format.

29. Cost price of an article is 100 selling price 120. Is it profit or loss transaction.

30. Can a triangle be formed with 7cm, 7cms and 7cm as its sides?

31. What are the angles of an Isosceles right angled triangle?

32. Is a triangle possible with the angle 90º, 90º and 0º? Why?

33. $(9 \times 5) + (10 \times 12)$ convert into a tree diagram.

34. Write the missing numbers in the trees : $15 \times (9 \div 3)$
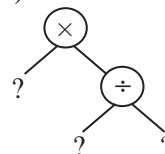
35. Convert the tree diagram into an algebraic expression.
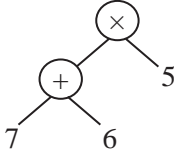
PART - C

VI. Answer any 5 questions : 5×3= 15

36. Find the HCF of the numbers 40 and 56 by division method.

37. A number is divisible by 9, if it is divisible by 3 explain your answer with reason.

38. In a school 200 litres of lemon juice is prepared. If 250ml lemon juice is given to each student. How many students get the juice?

39. Calculate your age as on 1.6.2018.

40. Valavan bought 24 eggs for 96. Four of them were broken and also he had a loss of 36 on selling them. What is the selling price of one egg?

41. Can a triangle be formed with the angles 70º, 60º, 50º. If yes, name the type of triangle.

42. If a ration shop has distributed 1,00,000 kg of rice to 5,000 families then find the quantity of rice given to each family.

43. Convert the following algebraic expression into tree diagram. $(x \times y) - (y \times z)$.

PART - D

VII. Answer any one of the following :
1×5= 5

44. Draw a line segment. AB = 7 cm and mark a point P on it. Draw a line perpendicular to the given line segment at 'P'.

45. Draw a line and mark a point R below it at a distance of 5.4 cms. Through R draw a line parallel to the given line.

✿ ✿ ✿

Answers

I. 1. b) 2
2. c) 71, 81
3. d) all are equal
4. b) 30
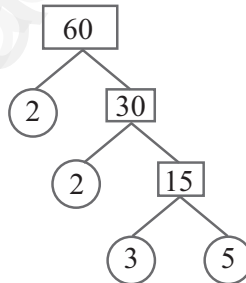5. b) S. P

II. 6. True
7. False
8. True
9. False
10. True

III. 11. 90º is - Right angle
12. Profit - Selling price – Cost Price
13. 4 hours - 240 minutes
14. 2 is an - even prime number
15. 1 Kg - 1000 grams

IV. 16. 15
17. $\dfrac{3}{4}$
18. 31
19. 21
20. two

V. 21. 60

$\therefore 60 = 2 \times 2 \times 3 \times 5$.

22. Smallest is : 11

Biggest is : 97

23. 10, 15

$$10 = 2 \times 5$$
$$15 = 3 \times 5$$

Product of common factors = 5

Product of other factors = $2 \times 3 = 6$

LCM (10, 15) = Product of common factors × Product of other factors

= $5 \times 6 = 30$

LCM (10, 15) = 30

TERM - III

CONTENTS

TERM - III

CHAPTER
01

FRACTIONS

✦ A fraction is a number of ways representing a part of a whole. The whole may be a single object or a group of objects.

✦ Fraction $= \dfrac{\text{Numerator}}{\text{Denominator}}$

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. $\dfrac{1}{4}$ 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 $\dfrac{1}{2}$

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. $\dfrac{1}{2}$, $\dfrac{2}{4}$, $\dfrac{3}{6}$ 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 $\dfrac{12}{15}$ is $\dfrac{4}{5}$ $\dfrac{12}{15} = \dfrac{12 \div 3}{15 \div 3} = \dfrac{4}{5}$

FRACTION IN REAL LIFE

✦ Nine - tenths 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.

ADDITION AND SUBTRACTION OF UNLIKE FRACTIONS

✦ Unlike fractions can be added or subtracted by converting them into 'like fractions'.

✦ While adding two like fractions the total number of parts (denominator) remains the same and the two numerators are added.

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✦ The process of finding the like fractions of the given unlike fractions can be made easier by finding the least common multiples of the denominators of the unlike fractions.

✦ By cross multiplication technique also we can find like fractions.

COMPARISON OF UNIT FRACTIONS

✦ Unit fractions are fractions having 1 as its numerator. E.g. $\dfrac{1}{7}$ and $\dfrac{1}{5}$

✦ In unit fractions, the larger the denominator the smaller will be the fraction.

✦ If the numerators are the same in two fractions, the fraction with the smaller denominator is greater of the two.

IMPROPER AND MIXED FRACTIONS

✦ A fraction whose numerator is always greater than the denominator is called an improper fraction E.g. $\dfrac{3}{2}$

MIXED FRACTION

✦ A fraction which is a sum of a whole number and a proper fraction is called as mixed fraction.

E.g. $1 + \dfrac{1}{4}$

✦ Any mixed fraction can be written as

$\text{Mixed Fraction} = \text{Quotient} + \dfrac{\text{Remainder}}{\text{Divisor}}$ (or)

$\text{Mixed Fraction} = \text{Quotient} \dfrac{\text{Remainder}}{\text{Divisor}}$

Improper fraction can be written in mixed fraction as

$\text{Improper fraction} = \dfrac{(\text{Whole number} \times \text{Denominator}) + \text{Numerator}}{\text{Denominator}}$

ADDITION AND SUBTRACTION OF MIXED FRACTIONS

✦ One way to add mixed fractions is to do the operation separately for the whole parts and then for fractional parts.

✦ We convert both mixed fractions into improper fractions and then add (or subtract them by converting into equivalent fractions with the same denominator.

✦ When both integral and fractional parts of minuend is greater than that of the subtrahend, the whole parts and fractional parts can be subtracted separately.

E.g. $5\dfrac{1}{2} - 3\dfrac{1}{4} = (5-3) + (\dfrac{1}{2} - \dfrac{1}{4}) = 2 + \dfrac{1}{4} = 2\dfrac{1}{4}$

MULTIPLICATION OF FRACTIONS

✦ Product of two fractions $= \dfrac{\text{Product of their numerators}}{\text{Product of their denominators}}$ E.g. $\dfrac{1}{2} \times \dfrac{1}{4} = \dfrac{1 \times 1}{2 \times 4} = \dfrac{1}{8}$

DIVISION OF FRACTIONS:

✦ Dividing a number by a fraction is the same as multiplying that number by the reciprocal of the fraction.

✦ The numerator and denominator of a fraction are interchanged to get its reciprocal.

E.g. $\dfrac{1}{2} \div \dfrac{1}{4} = \dfrac{1}{2} \times \dfrac{4}{1} = 2$

Think

1. **If all the three cakes are divided among the total participants of the function what would be each one's share? Discuss.**

Sol: Total participants of the function $= 9$

Total number of cakes $= 3$

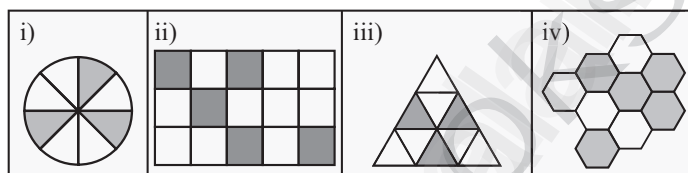∴.   Each cake should be divided into 3 equal parts.

∴.   Total number of equal parts of cake $= 9$

∴.   Each one's share may be $\dfrac{1}{9}$ of total cakes or $\dfrac{1}{3}$ of a cake.

TRY THESE

1. **Observe the following and represent the shaded parts as fraction.**

Sol: (i)   Total number of equal parts $=$ 8

                                    Shaded Parts $=$ 3

        Fraction representing the shaded parts $=$ $\dfrac{3}{8}$

(ii)   Total number of equal parts $=$ 15

                                    Shaded parts $=$ 5

        ∴Fraction representing the shaded parts $=$ $\dfrac{5}{15}$

(iii)   Total number of equal parts $=$ 9

                                    Shaded parts $=$ 3

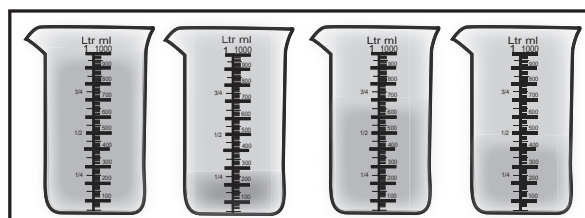   ∴ Fraction representing the shaded parts $=$ $\dfrac{3}{9}$

(iv)   Total number of equal parts $=$ 9

                                    Shaded parts $=$ 5

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

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

Sol: Quantity of water in the first beaker = 1 full

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

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

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

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

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

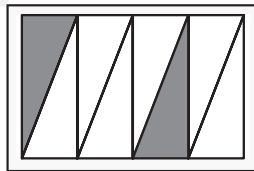| i)	ii)	iii)

Sol: (i)   Total number of equal parts = 3

Shaded parts = 2

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

(ii)   Total number of equal parts = 4

Shaded parts = 3

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

(iii)   Total number of equal parts = 5

Shaded parts = 4

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

4.   Write the fraction that represents the dots in the triangle.

Sol: Total number of dots = 24

Number of dots in the triangle = 6

∴Fraction represents the dots in the triangle = $\dfrac{6}{24}$
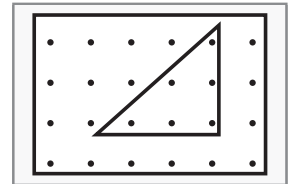
5.   Find the fractions of the shaded and unshaded portions in the following.

Sol: (a)   Total number of equal parts = 8

Shaded parts = 2

∴Fraction representing shaded parts = $\dfrac{2}{8}$

(b)   Total number of equal parts = 8

Unshaded parts = 6

∴Fraction of unshaded portion = $\dfrac{6}{8}$

Activity

Take a rectangular paper. Fold it into two equal parts. Shade one part, write the fraction. Again fold it into two halves. Write the fraction for the shaded part. Continue this process 5 times and write the fraction of the shaded part. Establish

the equivalent fractions of $\dfrac{1}{2}$ in the folded paper to your friends.

Sol: First time $= \dfrac{1}{2}$; Second time $= \dfrac{2}{4}$; Third time $= \dfrac{4}{8}$; Fourth time $= \dfrac{8}{16}$;

Fifth time $= \dfrac{16}{32}$

TRY THESE

1. Find the unknown in the following equivalent fractions.

i) $\dfrac{3}{5} = \dfrac{9}{\square}$ ii) $\dfrac{\square}{7} = \dfrac{16}{28}$ iii) $\dfrac{\square}{3} = \dfrac{10}{15}$ iv) $\dfrac{42}{48} = \dfrac{\square}{8}$

Sol: (i) We have $\dfrac{3}{5}$

$\dfrac{3}{5} = \dfrac{3 \times 3}{5 \times 3} = \dfrac{9}{15}$

$\therefore \dfrac{3}{5} = \dfrac{9}{\boxed{15}}$

(ii) $\dfrac{16}{28} = \dfrac{16 \div 4}{28 \div 4} = \dfrac{4}{7}$

$\therefore \dfrac{\boxed{4}}{7} = \dfrac{16}{28}$

(iii) $\dfrac{10}{15} = \dfrac{10 \div 5}{15 \div 5} = \dfrac{2}{3}$

$\dfrac{\boxed{2}}{3} = \dfrac{10}{15}$

(iv) $\dfrac{42}{48} = \dfrac{42 \div 6}{48 \div 6} = \dfrac{7}{8}$

$\therefore \dfrac{42}{48} = \dfrac{\boxed{7}}{8}$

TRY THESE

1. Shade the rectangle for the given pair of fractions and say which is greater among them.

i) $\frac{1}{3}$ and $\frac{1}{5}$		ii) $\frac{2}{5}$ and $\frac{5}{8}$	
Shade $\frac{1}{3}$	Shade $\frac{1}{5}$	Shade $\frac{2}{5}$	Shade $\frac{5}{8}$
$\frac{1}{3}$ is ——— than $\frac{1}{5}$.		$\frac{2}{5}$ is ——— than $\frac{5}{8}$.	
That is $\frac{1}{3}$ ——— $\frac{1}{5}$.		That is $\frac{2}{5}$ ——— $\frac{5}{8}$.	

Sol:

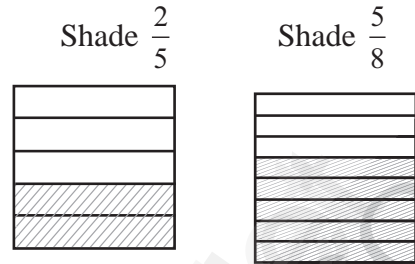i) $\dfrac{1}{3}$ and $\dfrac{1}{5}$

Shade $\dfrac{1}{3}$ Shade $\dfrac{1}{5}$
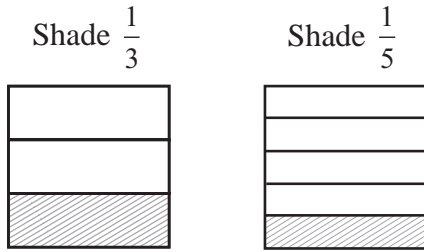
$\dfrac{1}{3}$ is <u>greater</u> than $\dfrac{1}{5}$. That is $\dfrac{1}{3}$ ___>___ $\dfrac{1}{5}$

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

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

$\dfrac{2}{5}$ is <u>lesser</u> than $\dfrac{5}{8}$. That is $\dfrac{2}{5}$ ___<___ $\dfrac{5}{8}$

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

Sol: LCM of the denominators 8 and 5 is 40.

Finding the equivalent fractions.

$$\dfrac{3}{8} = \dfrac{3\times 5}{8\times 5} = \dfrac{15}{40},$$

$$\dfrac{3}{5} = \dfrac{3\times 8}{5\times 8} = \dfrac{24}{40}$$

Here $\dfrac{24}{40} > \dfrac{15}{40}$ $\therefore \dfrac{3}{5} > \dfrac{3}{8}$

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

Sol: Equivalent fractions of $\dfrac{3}{5}$ are $\dfrac{6}{10}, \dfrac{9}{15}, \dfrac{12}{20}, \dfrac{15}{25}, \boxed{\dfrac{18}{30}},\dots\dots$

Equivalent fractions of $\dfrac{9}{10}$ are $\dfrac{18}{20}, \boxed{\dfrac{27}{30}}, \dots$

Equivalent fractions of $\dfrac{11}{15}$ are $\boxed{\dfrac{22}{30}},\dots$ Therefore $\dfrac{18}{30} < \dfrac{22}{30} < \dfrac{27}{30}$

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

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

Sol: Equivalent fractions of $\dfrac{9}{20}$ are $\dfrac{18}{40}, \boxed{\dfrac{27}{60}},\dots$

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

Equivalent fractions of $\dfrac{7}{12}$ are $\dfrac{14}{24}, \dfrac{21}{36}, \dfrac{28}{48}, \boxed{\dfrac{35}{60}},\dots$

Therefore $\dfrac{45}{60} > \dfrac{35}{60} > \dfrac{27}{60}$. The descending order of given fractions is $\dfrac{3}{4} > \dfrac{7}{12} > \dfrac{9}{20}$

TRY THESE

(i) $\dfrac{2}{3} + \dfrac{5}{7}$

By cross multiplication technique

$$\dfrac{2}{3} \overset{+}{\times} \dfrac{5}{7} = \dfrac{(2 \times 7) + (5 \times 3)}{3 \times 7} = \dfrac{14 + 15}{21} = \dfrac{29}{21}$$

$$\dfrac{2}{3} + \dfrac{5}{7} = \dfrac{29}{21}$$

(ii) $\dfrac{3}{5} - \dfrac{3}{8}$

By cross multiplication technique

$$\dfrac{3}{5} \overset{-}{\times} \dfrac{3}{8} = \dfrac{(3 \times 8) - (3 \times 5)}{5 \times 8}$$

$$= \dfrac{24 - 15}{40} = \dfrac{9}{40}$$

$$\dfrac{3}{5} - \dfrac{3}{8} = \dfrac{9}{40}$$

Activity

1. Using the given fractions $\dfrac{1}{5}, \dfrac{1}{6}, \dfrac{1}{10}, \dfrac{1}{15}, \dfrac{2}{15}, \dfrac{4}{15}, \dfrac{1}{30}, \dfrac{7}{30}$ and $\dfrac{9}{30}$ fill in the missing ones in the given 3×3 square in such a way that the addition of fractions through rows, columns and diagonals give the same total $\dfrac{1}{2}$.

	$\dfrac{1}{30}$	
	$\dfrac{1}{6}$	
$\dfrac{2}{15}$		

Sol :

$\dfrac{4}{15}$	$\dfrac{1}{30}$	$\dfrac{1}{5}$
$\dfrac{1}{10}$	$\dfrac{1}{6}$	$\dfrac{7}{30}$
$\dfrac{2}{15}$	$\dfrac{9}{30}$	$\dfrac{1}{15}$

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Sura's ○ Mathematics (FY) – 6th Std ○ Term-III ○ VI ○ FRACTIONS

TRY THESE

Complete the following table. The first one is done for you.

	Mixed fraction	Diagrams	Improper Fraction
i)	**3** circles are **completely shaded.** $\frac{1}{2}$ of another circle is shaded. That is totally $3\frac{1}{2}$ circles are shaded.		Each circle is divided into halves. There are totally **7 half circles shaded** which is equal to $\frac{7}{2}$.
ii)	**2** rectangles are **completely shaded.** $\frac{1}{4}$ portion of another rectangle is shaded. That is totally **2** $\frac{1}{4}$ rectangles are shaded.		Each rectangles is divided into $\frac{1}{4}$ or quarters or **one fourth**. There are totally ___ quarters of rectangles shaded which is equal to **$\frac{9}{4}$**.
iii)	**4** hexagons are **completely shaded.** $\frac{1}{6}$ portion of another hexagon is shaded. That is totally **$4\frac{1}{6}$** hexagons are shaded.		Each hexagon is divided into $\frac{1}{6}$ or **one sixth.** There are totally **25** one sixths of hexagons shaded which is equal to **$\frac{25}{6}$**.

Think

(i) Are $5\frac{2}{3}$ and $5\frac{4}{6}$ equal?

(ii) $\frac{3}{2} \neq 3\frac{1}{2}$ why?

Sol:

(i)
$$5\frac{2}{3} = \frac{(5 \times 3)+2}{3} = \frac{17}{3}$$

$$5\frac{4}{6} = \frac{(5 \times 6)+4}{6} = \frac{34}{6}$$

Equivalent fraction of

$$\frac{17}{3} = \frac{17 \times 2}{3 \times 2} = \frac{34}{6}$$

$$\therefore 5\frac{2}{3} \text{ and } 5\frac{4}{6} \text{ are equal}$$

(ii)
$$3\frac{1}{2} = \frac{(3 \times 2)+1}{2} = \frac{7}{2}$$

$$\frac{3}{2} \neq \frac{7}{2}$$

$$\therefore \frac{3}{2} \neq 3\frac{1}{2}$$

$$3\frac{1}{2} \text{ means } 3 + \frac{1}{2}$$

TRY THESE   (Text book Page No.11)

1. **Convert $3\dfrac{1}{3}$ into improper fraction.**

Sol:

$$\text{Improper fraction} = \frac{(\text{Whole number} \times \text{Denominator}) + \text{Numerator}}{\text{Denominator}}$$

$$3\frac{1}{3} = \frac{(3 \times 3) + 1}{3} = \frac{9 + 1}{3} = \frac{10}{3}$$

2. **Convert $\dfrac{45}{7}$ into mixed fraction.**

Sol:
$$\text{Divisor} \rightarrow 7\overline{)45}\quad \leftarrow \text{Quotient (6)}$$
$$\underline{42}$$
$$\underline{3} \leftarrow \text{Remainder}$$

$$\frac{45}{7} = \text{Quotient }\frac{\text{Remainder}}{\text{Divisor}} = 6\ \frac{3}{7}$$

$$\frac{45}{7} = 6\ \frac{3}{7}$$

TRY THESE   (Text book Page No.13)

1. **Find the sum of $5\dfrac{4}{9}$ and $3\dfrac{1}{6}$.**

Sol:
$$5\frac{4}{9} + 3\frac{1}{6} = 5 + \frac{4}{9} + 3 + \frac{1}{6}$$
$$= (5 + 3) + \frac{4}{9} + \frac{1}{6}$$
$$= 8 + \frac{8}{18} + \frac{3}{18} = 8 + \frac{8 + 3}{18} = 8 + \frac{11}{18} = 8\frac{11}{18}$$

$$\therefore 5\frac{4}{9} + 3\frac{1}{6} = 8\frac{11}{18}$$

3	9, 6
3	3, 2
2	1, 2
	1, 1

LCM (9, 6) = 18

2. **Subtract $7\dfrac{1}{6}$ from $12\dfrac{3}{8}$**

Sol:
$$12\frac{3}{8} - 7\frac{1}{6} = (12 - 7) + \left(\frac{3}{8} - \frac{1}{6}\right)$$
$$= 5 + \frac{(3 \times 3) - (1 \times 4)}{24}$$
$$= 5 + \frac{9 - 4}{24} = 5 + \frac{5}{24} = 5\frac{5}{24}$$

$$12\frac{3}{8} - 7\frac{1}{6} = 5\frac{5}{24}$$

2	6, 8
2	3, 4
3	3, 2
2	1, 2
	1, 1

LCM (9, 6) = 2 × 2 × 3 × 2 = 24

3. Subtract the sum of $6\dfrac{1}{6}$ and $3\dfrac{1}{5}$ from the sum of $9\dfrac{2}{3}$ and $2\dfrac{1}{2}$.

Sol:

$$\left(9\dfrac{2}{3}+2\dfrac{1}{2}\right)-\left(6\dfrac{1}{6}+3\dfrac{1}{5}\right) = \left(9+\dfrac{2}{3}+2+\dfrac{1}{2}\right)-\left(6+\dfrac{1}{6}+3+\dfrac{1}{5}\right)$$

$$= (9+2)+\dfrac{(2\times2)+(1\times3)}{6}-\left[(6+3)+\dfrac{(1\times5)+(1\times6)}{30}\right]$$

$$= 11+\dfrac{4+3}{6}-\left[9+\dfrac{5+6}{30}\right]$$

$$= 11+\dfrac{7}{6}-\left[9+\dfrac{11}{30}\right] = [11-9]+\left[\dfrac{7}{6}-\dfrac{11}{30}\right]$$

$$= 2+\left[\dfrac{(7\times5)-11}{30}\right] = 2+\left[\dfrac{35-11}{30}\right] = 2+\dfrac{24}{30} = 2\dfrac{4}{5}$$

💡 **Think**   (Text book Page No.15)

1. $2\dfrac{1}{4}\times3$ is not equal to $6\dfrac{1}{4}$. Why?

Sol: $2\dfrac{1}{4}\times3$ means $\left(2+\dfrac{1}{4}\right)\times3 = (2\times3)+\left(\dfrac{1}{4}\times3\right) = 6+\dfrac{3}{4} = 6\dfrac{3}{4} \neq 6\dfrac{1}{4}$

TRY THESE   (Text book Page No.15)

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

Sol: $35\times\dfrac{3}{7} = \dfrac{35\times3}{7} = \dfrac{105}{7} = 15$

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

Sol: $\dfrac{1}{5}$ of $15 = \dfrac{1}{5}\times15 = \dfrac{15}{5} = 3$

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

Sol: $\dfrac{1}{3}$ of $\dfrac{3}{4} = \dfrac{1}{3}\times\dfrac{3}{4} = \dfrac{1\times3}{3\times4} = \dfrac{3}{12} = \dfrac{1}{4}$

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

Sol: $7\dfrac{3}{4}\times5\dfrac{1}{2} = \dfrac{31}{4}\times\dfrac{11}{2} = \dfrac{31\times11}{4\times2} = \dfrac{341}{8}$

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 shaded in both colours out of the total numbers of grids gives the product $\frac{2}{12}$ 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?**

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

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

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

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

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

TRY THESE   **(Text book Page No.18)**

(i) **Find the value of $5 \div 2\frac{1}{2}$.**

Sol: $5 \div 2\frac{1}{2} = 5 \div \frac{5}{2} = 5 \times \frac{2}{5} = \frac{10}{5} = 2$ [reciprocal of $\frac{5}{2}$ is $\frac{2}{5}$]

(ii) **Simplify : $1\frac{1}{2} \div \frac{1}{2}$**

Sol: $1\frac{1}{2} \div \frac{1}{2} = \frac{3}{2} \div \frac{1}{2} = \frac{3}{2} \times \frac{2}{1} = \frac{6}{2} = 3$ [reciprocal of $\frac{1}{2}$ is $\frac{2}{1}$]

(iii) **Divide $8\frac{1}{2}$ by $4\frac{1}{4}$.**

Sol: $8\frac{1}{2} \div 4\frac{1}{4} = \frac{17}{2} \div \frac{17}{4} = \frac{17}{2} \times \frac{4}{17} = 2$

THIRD TERM - SUMMATIVE ASSESSMENT (SA) - 2022
MATHEMATICS

6TH **STD**

Register Number

Time Allowed 2.00 Hours]

[Max. Marks : 60

PART - A

I. Choose the best answer

$5 \times 1 = 5$

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. One unit to the right of -7 is _____

   (a) +1   (b) –8   (c) –7   (d) –6

4. Find the Perimeter of a triangle who sides are 3cm, 4cm and 5cm is _____

   (a) 12 cm   (b) 10 cm
   (c) 5 cm   (d) 11 cm

5. Which of the following letter does not have a line symmetry?

   (a) A   (b) P   (c) T   (d) U

II. Fill in the blanks $5 \times 1 = 5$

6. The number which has its own reciprocal is _____

7. The Potable water available at 100 m below the ground level is denoted as_____ m

8. –46 is to the _____ of –35 on the number line.

9. The _____ of any closed figure is the total length of its boundary.

10. The reflected image of the letter 'q' is _____

III. Match the following $5 \times 1 = 5$

11. Mixed fraction   - $S \times S$ sq. units.

12. The Successor of O is   - Two lines of symmetry

13. Area of Square   - 1

14. Isosceles triangle   - $5\frac{2}{3}$

15. Rectangle   - One line of symmetry

IV. Say True or False. $5 \times 1 = 5$

16. $3\frac{1}{4} \times 3\frac{1}{4} = 9\frac{1}{16}$.

17. Each of the integers –18, 6, –12, 0 is greater than –20.

18. –10 and 10 are at equal distance from 1.

19. A combined shape is the combination of several closed shapes.

20. The number 191 has rotational symmetry.

PART - B

V. Answer any 10 of the following.
Q.No.35 is compulsory.

$10 \times 2 = 20$

21. Add $\frac{2}{3}$ and $\frac{3}{5}$

22. Find the difference between $\frac{8}{9}$ and $\frac{2}{7}$

23. Convert $5\frac{3}{7}$ in to an improper fraction?

24. Convert $\frac{47}{6}$ in to a mixed fraction?

25. Mark the integers 4, –3, 6, –1 and –5 on the number line?

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26. Find the opposite of the following numbers?

   i) 44　　　　　　　ii) –312

27. Write all the integers between –5 and 4.

28. Using the number line, compare –14 and –11.

29. Find the Perimeter of a right angled triangle whose sides are 6 feet, 8 feet and 10 feet.

30. Find the area of a square of side 15 cm.

31. Find the Perimeter of the following shape?
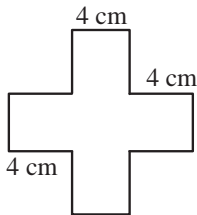
32. Draw the reflection image of the following figure about the given line.

   i) P |　　　　　ii) LOOK |

33. Draw a lines of symmetry for an equilateral triangle and square also find the number of lines of symmetry.

34. What words will you see if a mirror is placed below the words "MOM and WICK"?

35. Find the order of rotation for the following shape.


i)　　　　　　　　　ii)

PART - C

VI. Answer any five of the following questions. Q.No. 43 is compulsory.　　5 × 3 = 15

36. Gowri purchased $3\frac{1}{4}$ kg of tomatoes, $\frac{3}{4}$ kg of brinjal and $1\frac{1}{4}$ kg of Onion. What is the total weight of the vegetables she bought?

37. Nilavan can walk $4\frac{1}{2}$ km in an hour. How much distance will be covers in $3\frac{1}{2}$ hours?

38. Put the appropriate signs as <, > or = in the box.

   i)　–7 ☐ 8　　　ii)　–111 ☐ –111

   iii)　–999 ☐ –1000

39. Arrange the following integers in ascending order and descending order.

   –11,12,–13,14,–15,16,–17,18,–19,–20.

40. The Table given below contains some measures of the square, Find the unknown values.

S.No.	Side	Area
i)	6 cm	---
ii)	---	49 sq.feet

41. Draw the lines of symmetry for the given figure and also find the number of lines of symmetry.

i)　　　　　　ii)

ii)

42. Complete the other half of the following figures such that the dotted line is a lines of symmetry.
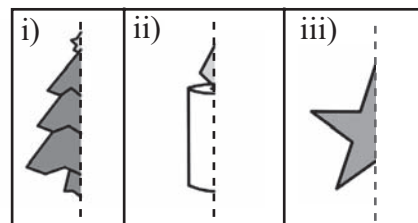
43. Find the Perimeter and area of the following shape.
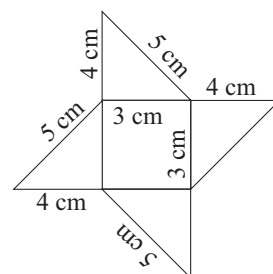
PART - D

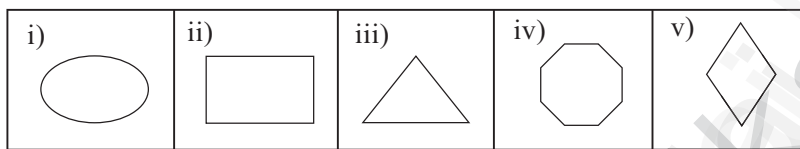### VII. Answer any One of the following questions. $1 \times 5 = 5$

44. Complete the table using the following hints:

C_1 : the first non- negative integer.

C_3 : the opposite to the second negative integer.

C_5 : the additive identity in whole numbers.

C_6 : the successor of the integer in C_2.

C_8 : the predecessor of the integer in C_7

C_9 : the opposite to the integer C_5

C_1	C_2 -5	C_3
C_4 6	C_5	C_6
C_7 -7	C_8	C_9

(OR)

45. Find the order of rotation for the following shape?

i)	ii)	iii)	iv)	v)
⬭	▭	△	⬡	◇

❖❖❖❖

ANSWERS

I.

1. (c) $\dfrac{17}{53}$

2. (a) 42

3. (d) −6

4. (a) 12 cm

5. (b) P

II.

6. 1

7. −100

8. left

9. perimeter

10. p

III.

11. Mixed fraction - $5\dfrac{2}{3}$

12. The Successor of O is - 1

13. Area of Square - S × S sq. units.

14. Isosceles triangle - One line of symmetry

15. Rectangle - Two lines of symmetry

IV.

16. False

17. True

18. False

19. True

20. False

PART - B

V.

21. $\dfrac{2}{3} + \dfrac{3}{5} = \dfrac{(2\times5)+(3\times3)}{15} = \dfrac{10+9}{15} = \dfrac{19}{15}$

22. Difference $= \dfrac{8}{9} - \dfrac{2}{7} = \dfrac{(8\times7)-(2\times9)}{63} = \dfrac{56-18}{63} = \dfrac{38}{63}$