तत् त्वं पूषन् अपावृणु
केन्द्रीय विद्यालय संगठन

KENDRIYA VIDYALAYA SANGATHAN

AHMEDABAD REGION

SUBJECT: MATHEMATICS

CLASS: IX

TERM-1

STUDENT SUPPORT MATERIAL

आज़ादी का अमृत महोत्सव

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Dr. JAIDEEP DAS,

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PRINCIPAL,

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SECTOR-3 GANDHINAGAR

CONTENT DEVELOPEMENT TEAM

S.NO	NAME OF TEACHERS	NAME OF KV
1	MR S.PRASAD	KV AFS WADSAR
2	MR BIPIN KUMAR	KV SAHIBAUG
3	MR H M JADEJA	KV GANDHINAGAR CANTT
4	MR VISHNU LEUA	KV SABARMATI

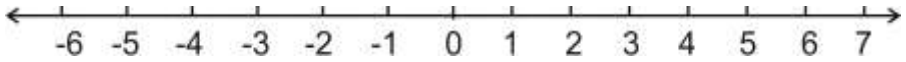
CLASS IX: CHAPTER - 1

NUMBER SYSTEM

(Term-I)

(Number System)

Key Concepts



1) Natural numbers are - 1, 2, 3, …….. Denoted by N.

2) Whole numbers are - 0, 1, 2, 3, …… denoted by W.

3) Integers - ……. -3, -2, -1, 0, 1, 2, 3, …… denoted by Z.

4) Rational numbers - All the numbers which can be written in the form p/q, $q \neq 0$ are called rational numbers where p and q are integers.

5) Irrational numbers - A number s is called irrational, if it cannot be written in the form p/q where p and q are integers and $q \neq 0$.

6) The decimal expansion of a rational number is either terminating or non-terminating recurring. Thus we say that a number whose decimal expansion is either terminating or non-terminating recurring is a rational number.

7) The decimal expansion of a irrational number is non terminating non-recurring.

8) All the rational numbers and irrational numbers taken together.

9) Make a collection of real number.

10) A real no is either rational or irrational.

11) If r is rational and s is irrational then r+s, r-s, r.s are always irrational numbers but r/s may be rational or irrational.

12) Every irrational number can be represented on a number line using Pythagoras theorem.

13) Rationalization means to remove square root from the denominator.

a. $\frac{3+\sqrt{5}}{\sqrt{2}}$ to remove we will multiply both numerator & denominator by $\sqrt{2}$

$\frac{1}{a \pm \sqrt{b}}$ its rationalization factor $a \mp \sqrt{b}$

MULTIPLE CHOICE QUESTION

1 A rational number between 3 and 4 is:

(a) $\frac{3}{2}$ (b) $\frac{4}{3}$ (c) $\frac{7}{2}$ (d) $\frac{7}{4}$

2 Which one of the following is not a rational number:

(a) $\sqrt{2}$ (b) 0 (c) $\sqrt{4}$ (d) $\sqrt{-16}$

3 Which one of the following is an irrational number:

(a) $\sqrt{4}$ (b) $3\sqrt{8}$ (c) $\sqrt{100}$ (d) $-\sqrt{0.64}$

4 $3\frac{3}{8}$ in decimal form is:

(a) 3.375 (b) 3.35 (c) 33.75 (d)337.5

5 0.3333… in $\frac{p}{q}$ form is

(a) $\frac{6}{99}$ (b) $\frac{1}{3}$ (c) $\frac{4}{7}$ (d) $\frac{5}{9}$

6 The value of $(4 + \sqrt{2})(4 - \sqrt{2})$ is:

(a) 2 (b) 3 (c) 14 (d) 6

7 The value of $(2 + \sqrt{2})(2 - \sqrt{2})$ is:

(a) 2 (b) 3 (c) 4 (d) 6

8 The value of $(3 + \sqrt{5})^2$

(a) $14 + 6\sqrt{5}$ (b) $4 + 6\sqrt{5}$ (c) $4 - 6\sqrt{5}$ (d) $14 - 6\sqrt{5}$

9 The value of $(5 + \sqrt{7})(4 + \sqrt{3})$ is:

(a) 20 +5 $\sqrt{3}$ +4$\sqrt{7}$ +$\sqrt{21}$

(b) 5 +20 $\sqrt{3}$ +21$\sqrt{7}$ +4$\sqrt{21}$

(c) 20 - 5 $\sqrt{3}$ +4$\sqrt{7}$ - $\sqrt{21}$

(d) 20 +5 $\sqrt{3}$ -4$\sqrt{7}$ -$\sqrt{21}$

10 Which of the following is true?

(a) Every whole number is a natural number (b) Every integer is a rational number

(c) Every rational number is an integer (d) Every integer is a whole number

11 If we add two irrational numbers, the resulting number

(a) is always an irrational number (b) is always a rational number

(c) may be a rational or an irrational number (d) always an integer

12 The value of $(\sqrt{11} + \sqrt{7})(\sqrt{11} - \sqrt{7})$ is:

(a)2 (b) 4 (c) 3 (d) -4

13 On rationalizing the denominator of $\frac{1}{\sqrt{7}}$, we get

(a) 7 (b) $\frac{\sqrt{7}}{7}$ (c) - $\frac{\sqrt{7}}{7}$ (d) $\sqrt{7}$

14 On rationalizing the denominator of $\frac{1}{\sqrt{7}+\sqrt{6}}$ we get

(a) $\frac{\sqrt{7}+\sqrt{6}}{\sqrt{7}-\sqrt{6}}$ (b) $\frac{\sqrt{7}-\sqrt{6}}{\sqrt{7}+\sqrt{6}}$ (c) $\sqrt{7} + \sqrt{6}$ (d) $\sqrt{7} - \sqrt{6}$

15 On rationalizing the denominator of $\frac{1}{\sqrt{2}+\sqrt{3}}$ we get

(a) $\sqrt{2} - \sqrt{3}$ (b) $\sqrt{3} - \sqrt{2}$ (c) 2 - $\sqrt{3}$ (d) 3 - $\sqrt{2}$

16 The value of $(16)^{\frac{3}{4}}$ is :

(a) 8 (b) 16 (c) 32 (d) 4

17 The value of $(125)^{\frac{-1}{3}}$ is :

(a) $\frac{1}{5}$ (b) $\frac{1}{25}$ (c) $\frac{1}{15}$ (d) $\frac{1}{125}$

18 Decimal expansion of a rational number is terminating if in its denominator there is:

(a) 2 or 5 (b) 3 or 5 (c) 9 or 11 (d) 3 or 7

19 The number of rational numbers between$\sqrt{3}$ and $\sqrt{5}$ is

(a) One (b) 3 (c) none (d) infinitely many

20 The value of n for which $\sqrt{n}$ be a rational number is

(a) 2 (b) 4 (c) 3 (d) 5

21 The value of $\left(\sqrt{3}-\sqrt{7}\right)^2$ is :

(a) $10+2\sqrt{21}$ (b) $10-2\sqrt{21}$ (c) $4+2\sqrt{21}$ (d) $4-2\sqrt{21}$

22 The value of $\left(5+\sqrt{5}\right)(5-\sqrt{5})$ is

(a) 25 (b) 20 (c) 50 (d)15

23 Which of the following is an irrational number?

(a) 3.14 (b) $3.\overline{14}$ (c) $3.1\overline{4}$ (d) 3.141141114…

24 Express $0.\overline{36}$ as a fraction in simplest form.

(a) $\frac{4}{11}$ (b) $\frac{5}{11}$ (c) $\frac{11}{4}$ (d) $\frac{11}{15}$

25 Rationalize the denominator of $\frac{6}{3+\sqrt{2}}$

(a) $\frac{6\left(3-\sqrt{2}\right)}{7}$ (b) $\frac{6\left(3+\sqrt{2}\right)}{7}$ (c) $\frac{6\left(4-\sqrt{2}\right)}{7}$ (d) $\frac{6\left(3-\sqrt{2}\right)}{(3-\sqrt{2})}$

Chapter - 4

(Linear Equations in two variables)

Key Concept

1) An equation of the form $ax + by + c = 0$ where a, b and c are real numbers such that a and b are not both zero is called a linear equation in two variables.

2) A pair of values of x and y which satisfy the equation $ax + by + c = 0$ is called a solution of the equation.

3) A linear equation in two variables has infinitely many solutions.

4) The graph of every linear equation in two variables is a straight line.

5) y = 0 is the equation of x-axis and x = 0 is equation of y-axis.

6) The graph of $x = a$ is a straight line parallel to the y-axis.

7) The graph of y = a is a straight line parallel to the x-axis.

8) An equation of the type y = mx represent a line passing through the origin.

MULTIPLE CHOICE QUESTION

1 x = -5 can be written in the form of equation in two variable as

(a) $x + o.y + 5 = 0$ (b) $o.x + y = -5$

(c) $o.x + o.y = -5$ (d) $o.x + o.y = +5$

2 The linear equation $3x - 2y = 5$ has

(a) a unique solution

(b) two solutions

(c) no solution

(d) infinitely many solutions.

3 The equation of x-axis is

(a) $x = k$ (b) y = 0 (c) $x = 0$ (d) y = k

4 Any point on the y-axis is of the form

(a) (x, y) (b) (x, x) (c) (0,y) (d) $(x, 0)$

5 The solution of the equation x – 2y = 4 is:

(a) (0, 2) (b) (4, 0) (c) (1, 1) (d) (2, 0)

6 In graphical representation of y = – 4, line is:

(a) parallel to x – axis (b) parallel to y – axis

(c) passes through origin (d) None of these.

7 The graph of line x – y = 0 passes through:

(a) (2, 3) (b) (3, 4) (c) (5, 6) (d) (0, 0)

8 Point (4, 1) lies on the line:

(a) x + 2y = 5 (b) x + 2y = –6

(c) x + 2y = 6 (d) x + 2y = 16

9 Graph of x = 2 is a line:

(a) parallel to x – axis (b) parallel to y – axis

(c) passes through origin (d) None of these.

10 The equation x = 7, in two variables, can be written as

(a) x + 0y = 7 (b) 0x + y = 7 (c) 0x + 0y = 7 (d) x + y = 7

11 The equation of x –axis is of the form

(a) x = 0 (b) y = 0 (c) x + y = 0 (d) x = y

12 If a linear equation has solutions (–2, 2), (0, 0) and (2, –2), then its is of the form

(a) y – x = 0 (b) x + y = 0 (c) –2x + y = 0 (d) –x + 2y = 0

13 The graph of the linear equation 2x + 3y = 6 is a line which meets the x axis at the point

(a) (2, 0) (b) (0, 3) (c) (3, 0) (d) (0, 2)

14 If we multiply or divide both sides of a linear equation with a non-zero number, then the solution of the linear equation:

(a) changes (b) remains the same

(c) changes in case of multiplication only (d) changes in case of division only

15 How many linear equation in x and y can be satisfied by x = 1 and y = 2?

(a) only one (b) two (c) infinitely many (d) three

16 Which of the following is not a linear equation in two variables?

(a) ax + by = c (b) ax^2 + by = c (c) 2x + 3y = 5 (d) 3x + 2y = 6

17 The graph of ax + by + c = 0 is

(a) a straight line parallel to x–axis (b) a straight line parallel to y–axis

(c) a general straight line (d) a line in the 2nd and 3rd quadrant

18 The solution of a linear equation in two variables is

(a) a number which satisfies the given equation

(b) an ordered pair which satisfies the given equation

(c) an ordered pair, whose respective values when substituted for x and y in the given equation, satisfies it

(d) none of these

19 A linear equation in two variables has

(a) no solution (b) only one solution (c) only two solutions (d) infinitely many solutions

20 The graph of the line $y = -3$ does not pass through the point

(a) $(2, -3)$ (b) $(3, -3)$ (c) $(0, -3)$ (d) $(-3, 2)$

21 Solution of the equation $2x + 1 = x + 3$ is:

(a) 3 (b) 1 (c) 2
(d) 4

22 Any point on the $y = x$ is of the form

(a) (a, a) (b) $(0, a)$ (c) $(a, 0)$ (d) $(a, -a)$

23 The graph of $y + 2 = 0$ is a line

(a) making an intercept –2 on the x-axis

(b) making an intercept –2 on the y-axis

(c) parallel to the x-axis at a distance of 2 units below the x-axis

(d) parallel to the y-axis at a distance of 2 units to the left of y-axis

24 The graph of $x = 4$ is a line

(a) making an intercept 4 on the x-axis

(b) making an intercept 4 on the y-axis

(c) parallel to the x-axis at a distance of 4 units from the origin

(d) parallel to the y-axis at a distance of 4 units from the origin

25 The point of the form $(a, -a)$, where $a \neq 0$, lies on

(a) the x-axis (b) the y-axis (c) the line $y = x$ (d) the line $x + y = 0$

CLASS IX : CHAPTER - 1

NUMBER SYSTEM

(Term-I)

(Number System)

ANSWER

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

11)c 12) b 13) b 14)d 15) a 16)a 17)a 18)a 19)d 20)b

21)b 22)b 23) d 24)a 25) a

Chapter - 4

(Linear Equations in two variables)

Answer

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

11) b 12) b 13) c 14)b 15)c 16) b 17) c 18) c 19) d 20) c

21)b 22) a 23) c 24) d 25) d

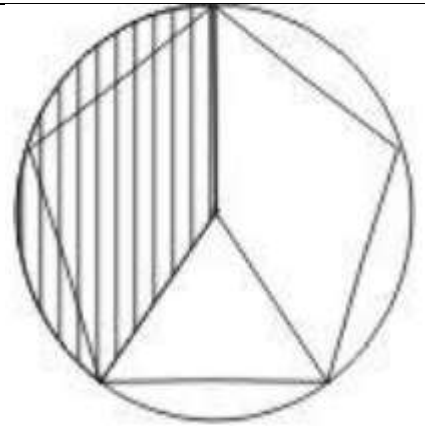
SUBJECT: MATHEMATICS

GRADE:9TH

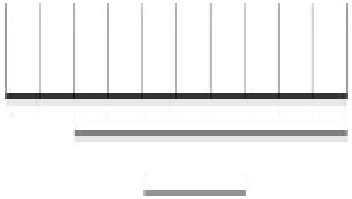
TOPIC NUMBER SYSTEM (CCT QUESTION)

SET 1

<table>
<tr><td>Q.NO.</td><td>Question with Answer Options</td><td>IMAGE IF ANY</td></tr>
<tr><td>1</td><td>What part of this figure is shaded?

<table>
<tr><td colspan="4">Answer Options</td></tr>
<tr><td>OPTION A</td><td>OPTION B</td><td>OPTION C</td><td>OPTION D</td></tr>
<tr><td>1/5</td><td>3/5</td><td>4/5</td><td>2/5</td></tr>
</table></td><td>  </td></tr>
<tr><td>Q.NO.</td><td>Question with Answer Options</td><td>IMAGE IF ANY</td></tr>
<tr><td>2</td><td>Which division will leave a remainder 2?

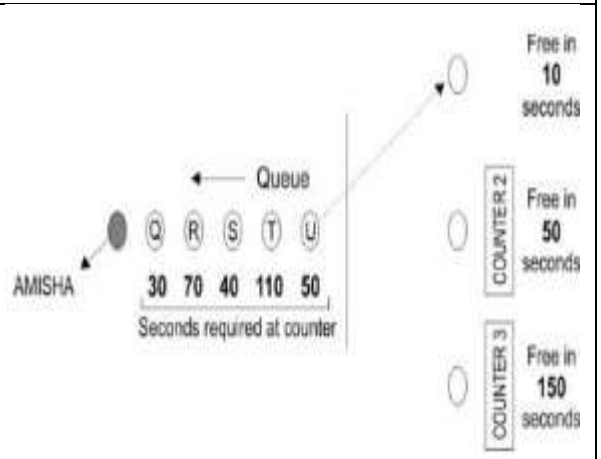
<table>
<tr><td colspan="4">Answer Options</td></tr>
<tr><td>OPTION A</td><td>OPTION B</td><td>OPTION C</td><td>OPTION D</td></tr>
<tr><td>345 / 3</td><td>536 /4</td><td>587 / 5</td><td>711/9</td></tr>
</table></td><td></td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td>Q.NO.</td><td>Question with Answer Options</td><td>IMAGE IF ANY</td></tr>
</table>

3	If the length of the longer line is 60 cm, the length of the shorter one is Answer Options OPTION A: 25cm | OPTION B: 22.5cm | OPTION C: 20cm | OPTION D: 18cm	
Q.NO.	Question with Answer Options	IMAGE IF ANY
4	**What fractional part of 7777 is 77?** Answer Options OPTION A: 1/11 | OPTION B: 1/77 | OPTION C: 1/100 | OPTION D: 1/101	
Q.NO.	Question with Answer Options	IMAGE IF ANY
5	**The value of $(-1)^0 - (-1)^1 - (-1)^2 - (-1)^3 - \ldots - (-1)^9 - (-1)^{10} =$** Answer Options OPTION A: 1 | OPTION B: 10 | OPTION C: 11 | OPTION D: 55	

SET 2

.NO.	Question with Answer Options	IMAGE IF ANY
1	**Aftab is checking his weight on a weighing scale. What is the reading on the scale, shown below?** Answer Options OPTION A: 50.3 kg | OPTION B: 50.7 kg | OPTION C: 52 kg | OPTION D: 53.5 kg	
Q.NO.	Question with Answer Options	IMAGE IF ANY
2	**If one of three consecutive even integers is m + 1, another of them could be** Answer Options OPTION A: M+4 | OPTION B: M+7 | OPTION C: m-2 | OPTION D: m-3	

<table>
<tr><td></td><td></td><td></td></tr>
<tr><td>Q.NO.</td><td>Question with Answer Options</td><td>IMAGE IF ANY</td></tr>
<tr><td>3</td><td>For which of these values of m is 0. 8 × 10^m a perfect cube?
<table>
<tr><td colspan="4">Answer Options</td></tr>
<tr><td>OPTION A</td><td>OPTION B</td><td>OPTION C</td><td>OPTION D</td></tr>
<tr><td>9</td><td>8</td><td>7</td><td>6</td></tr>
</table></td><td></td></tr>
<tr><td>Q.NO.</td><td>Question with Answer Options</td><td>IMAGE IF ANY</td></tr>
<tr><td>4</td><td>Badri, who collects stamps, gave half the number that he had to Varun, who had none. Varun gave half of these to Tariq, who also had none beforehand. If Tariq had given half the number he had back to Badri, the number of stamps with Badri would have been 20.

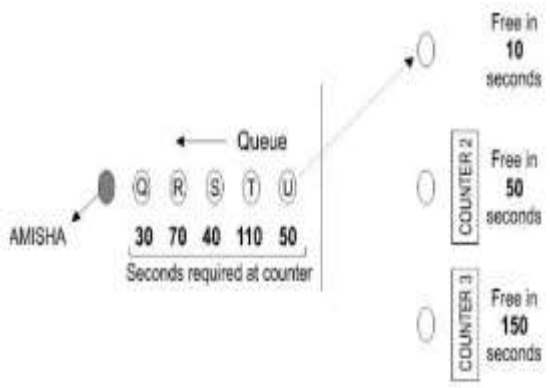
How many stamps did Varun give Tariq?
<table>
<tr><td colspan="4">Answer Options</td></tr>
<tr><td>OPTION A</td><td>OPTION B</td><td>OPTION C</td><td>OPTION D</td></tr>
<tr><td>4</td><td>8</td><td>16</td><td>32</td></tr>
</table></td><td></td></tr>
<tr><td>Q.NO.</td><td>Question with Answer Options</td><td>IMAGE IF ANY</td></tr>
<tr><td>5</td><td>Read the situation described below and answer the question.Amishagoes to her bank to withdraw money. When she reaches, there are 5 customers Q, R, S, T and U waiting before her as shown. The time that each person requires at the counter is also shown.
The bank has 3 counters, and as each becomes free, the first person in the queue is called to that counter. (For example: The person already in counter 1 requires 10 seconds more (as shown) -then customer U will be called to Counter 1 and so on.)
How long will Amisha have to wait?
<table>
<tr><td colspan="4">Answer Options</td></tr>
<tr><td>OPTION A</td><td>OPTION B</td><td>OPTION C</td><td>OPTION D</td></tr>
<tr><td>50 seconds</td><td>100 seconds</td><td>160 seconds</td><td>300 seconds</td></tr>
</table></td><td> 
</td></tr>
</table>

SET 3

<table>
<tr><td>Q.NO.</td><td>Question with Answer Options</td><td>IMAGE IF ANY</td></tr>
<tr><td>1</td><td>Read the situation described below and answer the question.Amishagoes to her bank to withdraw money. When she reaches, there are 5 customers Q, R, S, T and U waiting before her as shown. The time that each person requires at the counter is also shown.

The bank has 3 counters, and as each becomes free, the first personin the queue is called to that counter. (For example: The person already in counter 1 requires 10 seconds more (as shown) -then customer U will be called to Counter 1 and so on.)

When her turn comes, which counter will service Amisha?

<table>
<tr><td colspan="4">Answer Options</td></tr>
<tr><td>OPTION A</td><td>OPTION B</td><td>OPTION C</td><td>OPTION D</td></tr>
<tr><td>COUNTER 1</td><td>COUNTER 2</td><td>COUNTER 3</td><td>CAN NOT SAID</td></tr>
</table>
</td><td> 
</td></tr>
<tr><td>Q.NO.</td><td>Question with Answer Options</td><td>IMAGE IF ANY</td></tr>
<tr><td>2</td><td>0.000625 is the same as

<table>
<tr><td colspan="4">Answer Options</td></tr>
<tr><td>OPTION A</td><td>OPTION B</td><td>OPTION C</td><td>OPTION D</td></tr>
<tr><td>1/1000 x 625</td><td>1/1000000 +625</td><td>1000x 625</td><td>(1/1000000) x 625</td></tr>
</table>
</td><td></td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td>Q.NO.</td><td>Question with Answer Options</td><td>IMAGE IF ANY</td></tr>
<tr><td>3</td><td>If the square of ‘x’is 5, then square of ‘4x’will be

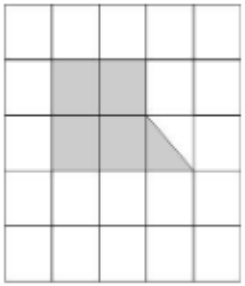
<table>
<tr><td colspan="4">Answer Options</td></tr>
<tr><td>OPTION A</td><td>OPTION B</td><td>OPTION C</td><td>OPTION D</td></tr>
<tr><td>400</td><td>80</td><td>60</td><td>20</td></tr>
</table>
</td><td></td></tr>
<tr><td></td><td></td><td></td></tr>
</table>

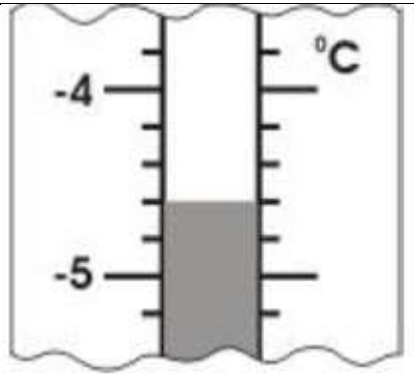
Q.NO.	Question with Answer Options	IMAGE IF ANY
4	**Which of the following is equal to 1?** Answer Options OPTION A: $17^{-2} + 17^{2}$ OPTION B: $17^{2} - 17^{-2}$ OPTION C: $17^{-2} \times 17^{2}$ OPTION D: $17^{2} / 17^{2}$	
Q.NO.	Question with Answer Options	IMAGE IF ANY
5	Which of the following numbers will have a '6' in the unit's place? Answer Options OPTION A: 2^{6} OPTION B: 2^{16} OPTION C: 2^{26} OPTION D: 2^{46}	

SET 4

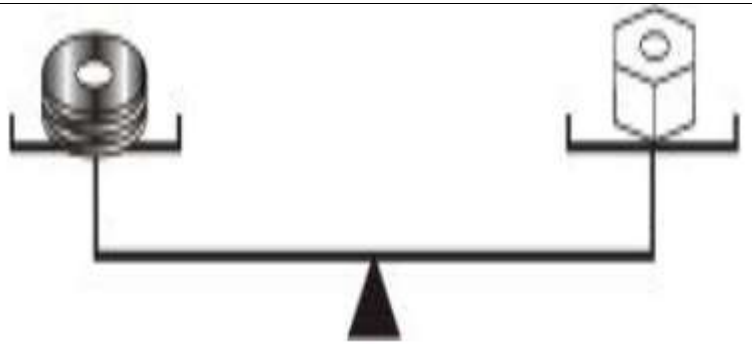
Q.NO.	Question with Answer Options	IMAGE IF ANY
1	**Scientific Notation is a concise way of writing any number in the form $a \times 10^{b}$ where a is a number between 1 and 10 and b is aninteger. For example, 652 would be written as 6.52×10^{2}in this notation. Which of the following is most likely to contain a negative exponent of 10 when represented in scientific notation?** Answer Options OPTION A: Number of cells in a honeycomb OPTION B: Speed of light in kilometres per second OPTION C: Diameter of a blood cell in centimetres OPTION D: Mass of an airplane in kilograms	

<table>
<tr><td>Q.NO.</td><td>Question with Answer Options</td><td>IMAGE IF ANY</td></tr>
<tr><td>2</td><td>What decimal fraction of the figure below is shaded

<table>
<tr><td colspan="4">Answer Options</td></tr>
<tr><td>OPTION A</td><td>OPTION B</td><td>OPTION C</td><td>OPTION D</td></tr>
<tr><td>0.45</td><td>0.045</td><td>0.09</td><td>0.18</td></tr>
</table>
</td><td>  </td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td>Q.NO.</td><td>Question with Answer Options</td><td>IMAGE IF ANY</td></tr>
<tr><td>3</td><td>Which of the following statements can be true for a natural number N?
<table>
<tr><td colspan="4">Answer Options</td></tr>
<tr><td>OPTION A</td><td>OPTION B</td><td>OPTION C</td><td>OPTION D</td></tr>
<tr><td>When N is divided by 3, the remainder is 3 and when N is divided by 6, the remainder is 0.</td><td>When N is divided by 3, the remainder is 0 and when N is divided by 6, the remainder is 3.</td><td>When N is divided by 3, the remainder is 1 and when N is divided by 6, the remainder is 0.</td><td>All the three statements can be true.</td></tr>
</table>
</td><td></td></tr>
<tr><td>Q.NO.</td><td>Question with Answer Options</td><td>IMAGE IF ANY</td></tr>
<tr><td>4</td><td>If 20% of your Maths score is equal to 30% of my Maths score on a test, which of the following best describes the relation between our scores?
<table>
<tr><td colspan="4">Answer Options</td></tr>
<tr><td>OPTION A</td><td>OPTION B</td><td>OPTION C</td><td>OPTION D</td></tr>
<tr><td>Your score is $1\frac{1}{2}$ times mine</td><td>My score is 1/2 times yours.</td><td>You scored 10 marks more than me.</td><td>I scored 10% more than you.</td></tr>
</table>
</td><td></td></tr>
<tr><td></td><td></td><td></td></tr>
</table>

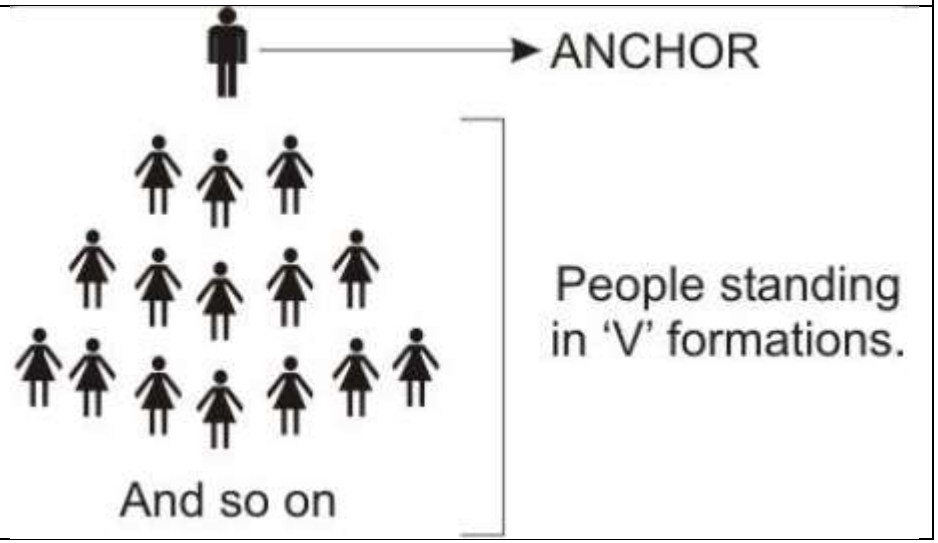
<table>
<tr><th>Q.NO.</th><th>Question with Answer Options</th><th>IMAGE IF ANY</th></tr>
<tr><td>5</td><td>A part of a room thermometer is shown below.What temperature is the thermometer showing?
<table>
<tr><th colspan="4">Answer Options</th></tr>
<tr><td>OPTION A</td><td>OPTION B</td><td>OPTION C</td><td>OPTION D</td></tr>
<tr><td>-4.3 deg C</td><td>-4.6 deg C</td><td>-5.2 deg C</td><td>-5.4 deg C</td></tr>
</table></td><td> 
</td></tr>
</table>

SET 5

<table>
<tr><th>Q.NO.</th><th>Question with Answer Options</th><th>IMAGE IF ANY</th></tr>
<tr><td>1</td><td>The weighing scale below has 5 regular sized CD's on one side balancing a weight on the other. What is the weight on the right likely to be?
<table>
<tr><th colspan="4">Answer Options</th></tr>
<tr><td>OPTION A</td><td>OPTION B</td><td>OPTION C</td><td>OPTION D</td></tr>
<tr><td>20mg</td><td>10g</td><td>100g</td><td>300g</td></tr>
</table></td><td>  </td></tr>
</table>

<table>
<tr><td>Q.NO.</td><td>Question with Answer Options</td><td>IMAGE IF ANY</td></tr>
<tr><td>2</td><td>What is the smallest number by which you have to multiply the product 3 x 4 x 5 x 11 x 15 to get a perfect square number?
<table><tr><td colspan="4">Answer Options</td></tr><tr><td>OPTION A</td><td>OPTION B</td><td>OPTION C</td><td>OPTION D</td></tr><tr><td>11</td><td>44</td><td>2475</td><td>9900</td></tr></table></td><td></td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td>Q.NO.</td><td>Question with Answer Options</td><td>IMAGE IF ANY</td></tr>
<tr><td>3</td><td>If the numerator of an expression is the sum of p, q and r and the denominator of the expression is the sum of 3p, 3q and 3r,thenexpression will be reduces to
<table><tr><td colspan="4">Answer Options</td></tr><tr><td>OPTION A</td><td>OPTION B</td><td>OPTION C</td><td>OPTION D</td></tr><tr><td>1/3</td><td>1/9</td><td>1/27</td><td>1/ 3pqr</td></tr></table></td><td></td></tr>
<tr><td>Q.NO.</td><td>Question with Answer Options</td><td>IMAGE IF ANY</td></tr>
<tr><td>4</td><td>Which of these sets of consecutive numbers has a product of 54834?
<table><tr><td colspan="4">Answer Options</td></tr><tr><td>OPTION A</td><td>OPTION B</td><td>OPTION C</td><td>OPTION D</td></tr><tr><td>46,47,48</td><td>37,38,39</td><td>33,34,35</td><td>22,23,24</td></tr></table></td><td></td></tr>
<tr><td></td><td></td><td></td></tr>
</table>

<table>
<tr><th>Q.NO.</th><th>Question with Answer Options</th><th>IMAGE IF ANY</th></tr>
<tr><td>5</td><td>At a party, one person chooses to anchor a game and everyone else stands in V formations as shown below.3 people stand in the innermost V, 5 in the next and so on. If there are 125 people (including the anchor) at the party, how many complete V's will they be able to form?

<table>
<tr><th colspan="4">Answer Options</th></tr>
<tr><td>OPTION A</td><td>OPTION B</td><td>OPTION C</td><td>OPTION D</td></tr>
<tr><td>5</td><td>10</td><td>12</td><td>21</td></tr>
</table>
</td><td> 
</td></tr>
</table>

SUBJECT: MATHEMATICS

GRADE:9TH

TOPIC LINEAR EQUATION IN TWO VARIABLE (CHAPTER 4)

SET 1

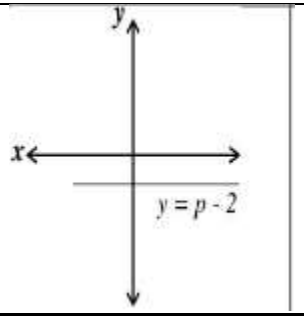
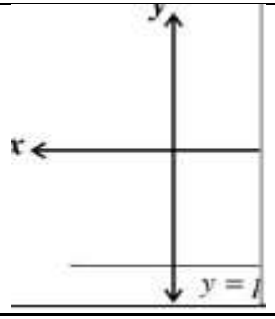
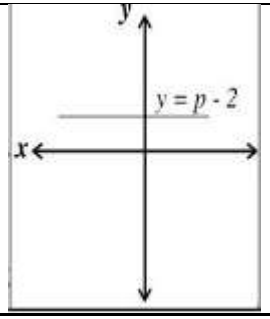
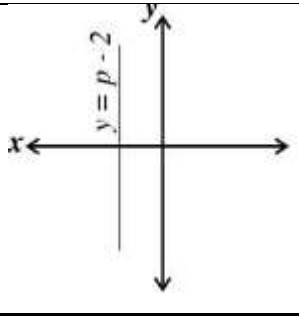
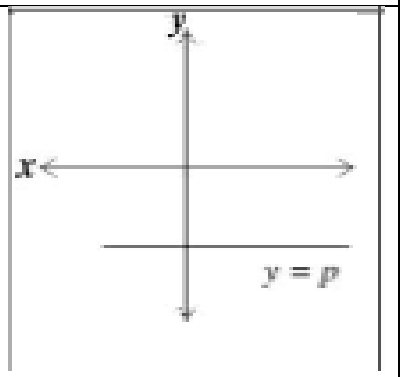
<table>
<tr><td>Q.NO.</td><td>Question with Answer Options</td><td>IMAGE IF ANY</td></tr>
<tr><td>1</td><td>There are only 1-rupee and 2-rupee coins in a bag. The total value of the 1-rupee coins is the same as the total value of the 2-rupee coins. If the bag has xcoins in all, what is their total value (in Rs.)?

<table>
<tr><td colspan="4">Answer Options</td></tr>
<tr><td>OPTION A</td><td>OPTION B</td><td>OPTION C</td><td>OPTION D</td></tr>
<tr><td>3x</td><td>4x/3</td><td>3x/4</td><td>3x/2</td></tr>
</table></td><td></td></tr>
<tr><td>Q.NO.</td><td>Question with Answer Options</td><td>IMAGE IF ANY</td></tr>
<tr><td>2</td><td>A 3 kg bag of rice lasts exactly 30 days for Mrs. and Mr. Pestonjee when both consume equal amounts. If Mr. Pestonjee cuts down his rice intake by half on his doctor's advice, how many days would a 3 kg bag last them?

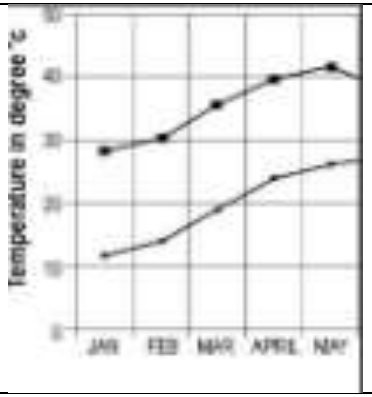
<table>
<tr><td colspan="4">Answer Options</td></tr>
<tr><td>OPTION A</td><td>OPTION B</td><td>OPTION C</td><td>OPTION D</td></tr>
<tr><td>5</td><td>40</td><td>42</td><td>45</td></tr>
</table></td><td></td></tr>
<tr><td></td><td></td><td></td></tr>
</table>

Q.NO.	Question with Answer Options	IMAGE IF ANY
3	A 200 metre long train running at a speed of 10 metre/second starts passing by a 200 metre long platform at exactly 11:00:10.See the adjoining images.What would be the time when the entire train just finishes crossing the platform? Answer Options OPTION A: 11:00:20 OPTION B: 11:00:30 OPTION C: 11:00:44 OPTION D: 11:00:50	
Q.NO.	Question with Answer Options	IMAGE IF ANY
4	Shopkeeper decreases the selling price of a ceiling fan by 10% at the start of winter. When winter is over, he decides to raise the price back to the original selling price. By what percent would he need to increase the lowered price in order to do this? Answer Options OPTION A: 20% OPTION B: 11.11% OPTION C: 10% OPTION D: 9.99%	
Q.NO.	Question with Answer Options	IMAGE IF ANY
5	Sohail's autumn break lasted x days. Of these, he was out of station for 8 days. For the remaining days, his mother promised him Rs. 10 per day to clean up the whole house. At the end of the break, she was so happy with his work, that she decided to square the amount due to him. What is the amount that Sohail got? Answer Options OPTION A: Rs $(100x^2-8)$ OPTION B: Rs $[10+x-8]^2$ OPTION C: Rs $10(x-8)^2$ OPTION D: Rs $100(x-8)^2$	

SET 2

<table>
<tr><th>Q.NO.</th><th>Question with Answer Options</th><th>IMAGE IF ANY</th></tr>
<tr><td>1</td><td>The graph of y = p is shown in the adjoining image. Which of the following depicts the graph of y = p -2?
<table>
<tr><th colspan="4">Answer Options</th></tr>
<tr><td>OPTION A</td><td>OPTION B</td><td>OPTION C</td><td>OPTION D</td></tr>
<tr><td> 
</td><td> 
</td><td> 
</td><td> 
</td></tr>
</table></td><td> 
</td></tr>
<tr><td>Q.NO.</td><td>Question with Answer Options</td><td>IMAGE IF ANY</td></tr>
<tr><td>2</td><td>Mrs. Nair opts for a mobile phone offer that charges a monthly fee of Rs. 250 plus a charge of Rs. 1.25 per minute for local calls. She fixes a budget of Rs. 400 per month for her mobile phone bill. At most how many minutes can she use the phone (local) each month while staying within her budget
<table>
<tr><th colspan="4">Answer Options</th></tr>
<tr><td>OPTION A</td><td>OPTION B</td><td>OPTION C</td><td>OPTION D</td></tr>
<tr><td>100</td><td>110</td><td>120</td><td>150</td></tr>
</table></td><td></td></tr>
<tr><td></td><td></td><td></td></tr>
</table>

<table>
<tr><td></td><td></td><td></td></tr>
<tr><td>Q.NO.</td><td>Question with Answer Options</td><td>IMAGE IF ANY</td></tr>
<tr><td>3</td><td>The graph in the adjoining image shows the average maximum and minimum monthly temperatures in Ahmedabad in a year. In which of the following periods did the average maximum temperature record a steady fall?

<table><tr><td colspan="4">Answer Options</td></tr><tr><td>OPTION A</td><td>OPTION B</td><td>OPTION C</td><td>OPTION D</td></tr><tr><td>July to Sep</td><td>Sep to Nov</td><td>Feb to Apr</td><td>May to July</td></tr></table></td><td>  </td></tr>
<tr><td>Q.NO.</td><td>Question with Answer Options</td><td>IMAGE IF ANY</td></tr>
<tr><td>4</td><td>A painter is able to paint a flat in 8 days. How many days would it have taken to paint the flat if he had two more painters working with him -one working at the same speed as him, and another working at double that speed ?

<table><tr><td colspan="4">Answer Options</td></tr><tr><td>OPTION A</td><td>OPTION B</td><td>OPTION C</td><td>OPTION D</td></tr><tr><td>11</td><td>5</td><td>4</td><td>2</td></tr></table></td><td></td></tr>
<tr><td>Q.NO.</td><td>Question with Answer Options</td><td>IMAGE IF ANY</td></tr>
<tr><td>5</td><td>The ratio of the height of two plants X and Y is 2:1. If plant X grows at the rate of 2 meters per year, at what rate should plant Y grow so that after 4 years they are of the same height

<table><tr><td colspan="4">Answer Options</td></tr><tr><td>OPTION A</td><td>OPTION B</td><td>OPTION C</td><td>OPTION D</td></tr><tr><td>1.5 metres per year</td><td>2.25 metres per year</td><td>2.5 metres per year</td><td>It will vary depending on the height of Y</td></tr></table></td><td></td></tr>
</table>

SUBJECT: MATHEMATICS

GRADE:9TH

TOPIC NUMBER SYSTEM ANSWER

Q. N0.	1	2	3	4	5
SET 1	D	C	B	D	A
SET 2	D	D	C	B	C
SET 3	B	D	C	C	B
SET 4	C	D	B	A	B
SET 5	C	A	A	B	B

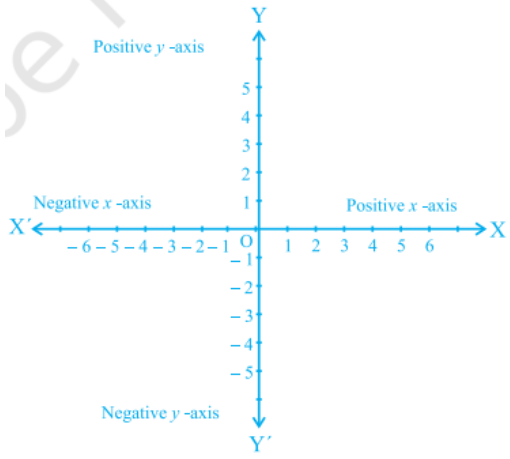
TOPIC LINEAR EQUATION IN TWO VARIABLE (CHAPTER 4) ANSWER

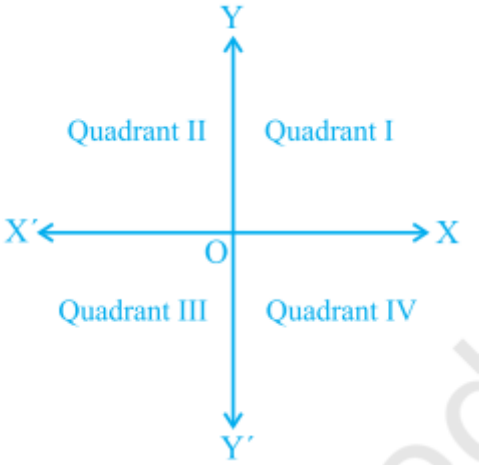
Q. N0.	1	2	3	4	5
SET 1	B	B	D	B	D
SET 2	B	C	D	D	D

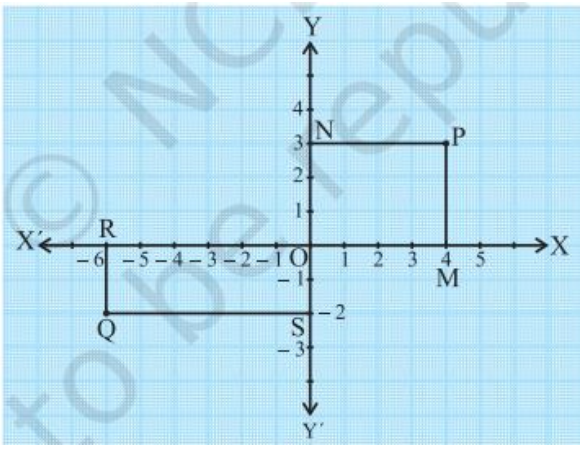
Class IX Mathematics
Chapter 3 Coordinate Geometry

Summary

1. To locate the position of an object or a point in a plane, we require two perpendicular lines. One of them is horizontal, and the other is vertical.
2. The plane is called the Cartesian, or coordinate plane and the lines are called the coordinate axes.
3. The horizontal line is called the *x* -axis, and the vertical line is called the *y* -axis.
4. The coordinate axes divide the plane into four parts called quadrants.
5. The point of intersection of the axes is called the origin.
6. The distance of a point from the *y* - axis is called its *x*-coordinate, or abscissa, and the distance of the point from the *x*-axis is called its *y*-coordinate, or ordinate.
7. If the abscissa of a point is *x* and the ordinate is *y*, then (*x*, *y*) are called the coordinates of the point.
8. The coordinates of a point on the *x*-axis are of the form (*x*, 0) and that of the point on the *y*-axis are (0, *y*).
9. The coordinates of the origin are (0, 0).
10. The coordinates of a point are of the form (+ , +) in the first quadrant, (–, +) in the second quadrant, (–, –) in the third quadrant and (+, –) in the fourth quadrant, where + denotes a positive real number and – denotes a negative real number.







Coordinates of
P (4, 3)
Q (-6, -2)
M (4, 0)
N (0, 3)
R (-6, 0)
S (0, -2)
O (0, 0)

Multiple Choice Questions

1 x coordinate of any point is its perpendicular distance from _____

(a) X- axis
(b) Y – axis
(c) Both X and Y axes
(d) None

2 x coordinate of any point on the Y axis is always _____

(a) Positive Real Number
(b) Negative Real Number
(c) Zero
(d) None

3 x and y coordinates of any point lying in the third quadrant are _____

(a) Both Positive Real Number
(b) Both Negative Real Number
(c) One Positive and One Negative Real Number
(d) None

4 The point with coordinates (5, -3) lies in the _____

(a) First Quadrant
(b) Second Quadrant
(c) Third Quadrant
(d) Fourth Quadrant

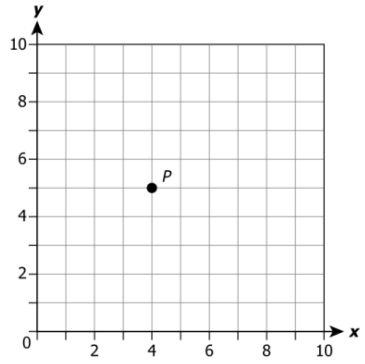
5 The point with coordinates (5, 0) lies on the _____

(a) X- axis
(b) Y – axis
(c) Both X and Y axes
(d) None

6 The distance of a point F (-4, 6) from the Y axis is _____

(a) 4 Units
(b) -4 Units
(c) 6 Units
(d) None

7 What is the coordinate of the point P shown on the coordinate grid?



(a) (-4, -5)
(b) (4, -5)
(c) (-4, 5)
(d) (4, 5)

8 A point P (a, b) is such that: $a < 0$, $b > 0$. In which quadrant does the point P lie?
(a) First Quadrant
(b) Second Quadrant
(c) Third Quadrant
(d) Fourth Quadrant

9 Amit's school is 5 km to the west and 3 km north of his house. He represented his house and his school on a coordinate grid, with his house located at the origin, and the positive x axis represent the direction that is east of his house. If 1 unit on the coordinated grid represents 1 km, what will be the coordinate of his school?
(a) (5, 3)
(b) (3, 5)
(c) (-5, 3)
(d) (3, -5)

10 On joining points (0, 0), (0, 2), (2, 2) and (2, 0), we obtain a _____
(a) Rectangle
(b) Rhombus
(c) Square
(d) Parallelogram

11 The point with coordinates (p, q) where p = q lies on _____ quadrants.
(a) First and Second
(b) Second and Third
(c) Third and Fourth
(d) First and Third

12 The points (-3, 4) and (3, -4) lies on
(a) The Same Quadrants
(b) First and Second Quadrants
(c) Second and Third Quadrants
(d) Second and Fourth Quadrants

13 The positive abscissa of a point lies on
(a) First and Second Quadrants
(b) Second and Fourth Quadrants
(c) First and Fourth Quadrants
(d) Second and Third Quadrants

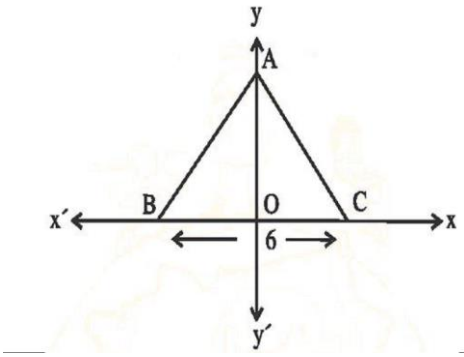
14 The negative ordinate of a point lies on
(a) First and Second Quadrants
(b) Second and Third Quadrants
(c) Third and Fourth Quadrants
(d) First and Fourth Quadrants

15 The point (-7, 0) lies on the
(a) Positive side of X axis
(b) Negative side of X axis
(c) Positive side of Y axis
(d) Negative side of Y axis

16 The point (0, 6) lies on the
(a) Positive side of X axis
(b) Negative side of X axis
(c) Positive side of Y axis
(d) Negative side of Y axis

17 The origin lies on
(a) X axis
(b) Y axis
(c) Both X and Y axes
(d) None

18 ABC is an equilateral triangle as shown in the figure, Find the coordinates of vertex A.



(a) (6. 0)
(b) (0, 6)
(c) $(0, 3\sqrt{3})$
(d) $(3\sqrt{3}, 0)$

19 Find the distance between the points (0,5) and (0, -3)
(a) 5 units
(b) 3 units
(c) 2 units
(d) 8 units

20 Find the distance between the points (3, 0) and (-5, 0)
(a) 5 units
(b) 3 units
(c) 2 units
(d) 8 units

21 x and y coordinates of any point lying in the first quadrant are _____
(a) Both Positive Real Number
(b) Both Negative Real Number
(c) One Positive and One Negative Real Number
(d) None

22 The distance of a point F (-4, 6) from the X axis is _____
(a) 4 Units
(b) -4 Units
(c) 6 Units
(d) -6 Units

23 A point P (a, b) is such that: $a < 0$, $b < 0$. In which quadrant does the point P lie?

(a) First Quadrant
(b) Second Quadrant
(c) Third Quadrant
(d) Fourth Quadrant

24 On joining points (0, 0), (0, 2), (5, 2) and (5, 0), we obtain a _____

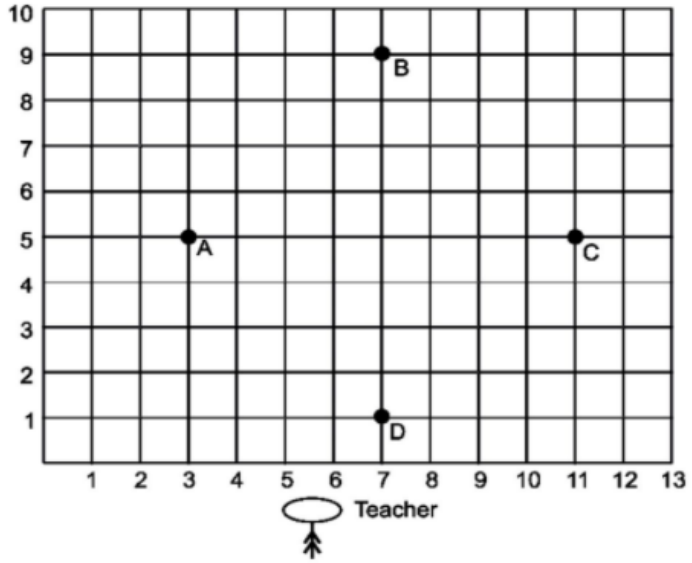
(a) Rectangle
(b) Rhombus
(c) Square
(d) Parallelogram

25 The points (0, -4) and (4, 0) lie on

(a) Same Axes
(b) Different Axes
(c) First Quadrant
(d) Third Quadrant

Case Study based Questions (Answer any four sub parts)

26 Students of a school are standing in rows and columns in their playground for a drill practice. A, B, C and D are the positions of four students as shown in the figure.



(i) What are the coordinates of A and B respectively?

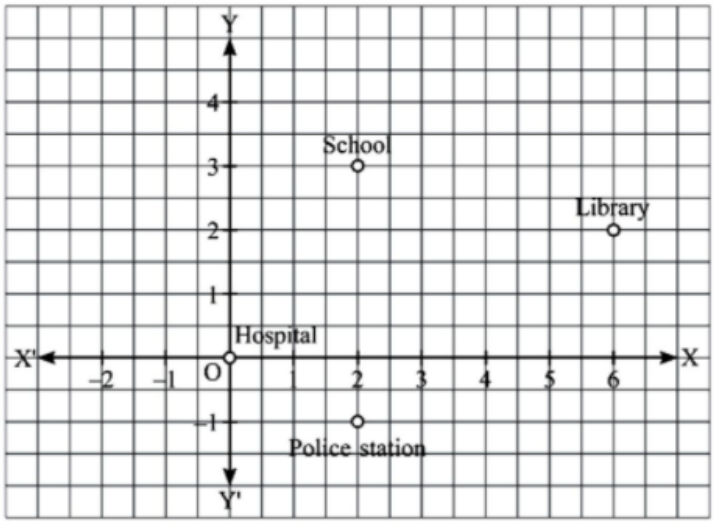
(a) A (3, 5); B (7, 8)
(b) A (5, 3); B (8, 7)
(c) A (3, 5); B (7, 9)
(d) A (5, 3); B (9, 7)

(ii) What are the coordinates of C and D respectively?

(a) C (11, 5); D (7, 1)
(b) C (5, 11); D (1, 7)
(c) C (5, 11); D (7, 1)
(d) C (5, 11); D (-1, 7)

(iii) What is the distance between B and D?
(a) 5 units
(b) 14 units
(c) 8 units
(d) 10 units
(iv) What is the distance between A and C?
(a) 5 units
(b) 14 units
(c) 8 units
(d) 10 units
(v) What are the coordinates of the point of intersection of AC and BD?
(a) (7, 5)
(b) (5, 7)
(c) (7, 7)
(d) (5, 5)

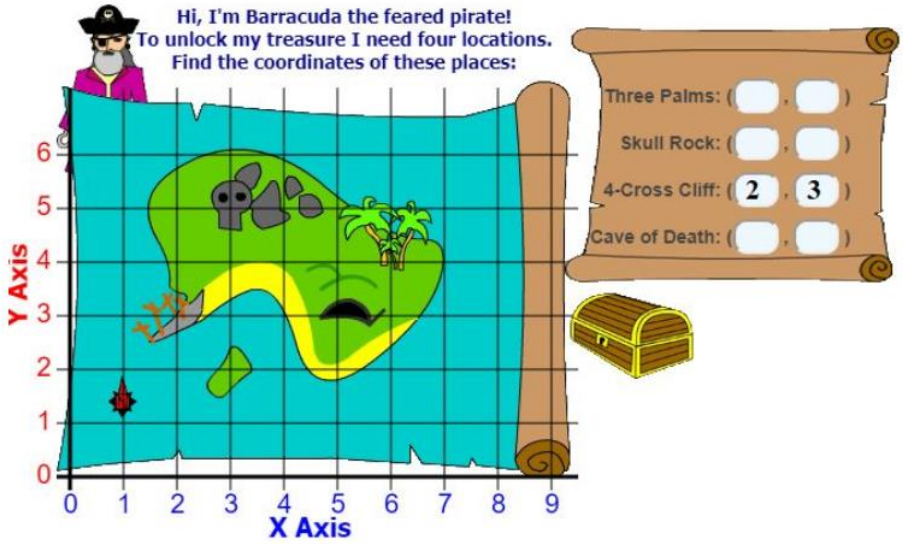
27 Aditya is a Class IX student residing in a village. One day, he went to a city Hospital along with his grandfather for general check-up. From there he visited three places -
School, Library and Police Station. After returning to his village, he plotted a graph by taking Hospital as origin and marked three places on the graph as per his direction of movement and distance. The graph is shown below:



(i) What are the coordinates of School?
(a) (3, 2)
(b) (2, 3)
(c) (3, 5)
(d) (5, 3)
(ii) What are the coordinates of Police Station?
(a) (2, -1)
(b) (2, 1)
(c) (-2, -1)
(d) (-2, 1)

(iii) Distance between school and police station is
(a) 4 units
(b) 3 units
(c) 2 units
(d) 1 unit
(iv) What are the coordinates of Library?
(a) (2, 6)
(b) (2, -6)
(c) (6, -2)
(d) (6, 2)
(v) In which quadrant the point (-1, 4) lies?
(a) Quadrant I
(b) Quadrant II
(c) Quadrant III
(d) Quadrant IV

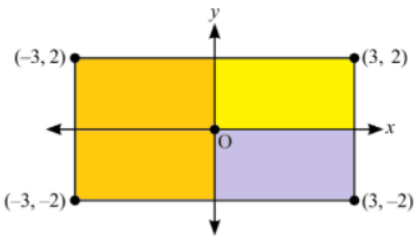
28 Shikha and Sanjana are playing a board game of Treasure Island.



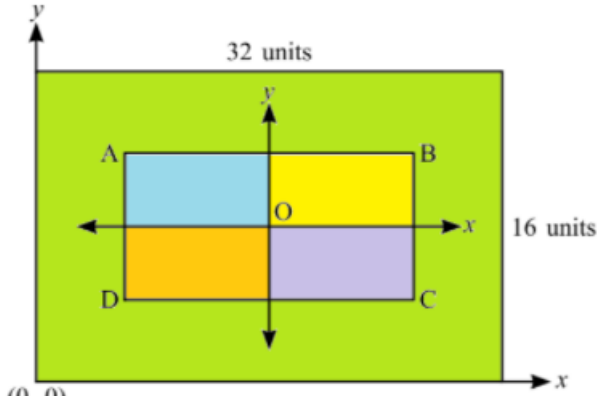
(i) What is the distance of the SKULL ROCK from the x-axis?
(a) 2 units
(b) 3 units
(c) 4 units
(d) 5 units
(ii) The coordinates of CAVE OF DEATH are
(a) (5,3)
(b) (3,5)
(c) (3,3)
(d) (5,5)
(iii) The distance between FOUR CROSS CLIFF and the CAVE OF DEATH is
(a) 2 units
(b) 3 units
(c) 4 units
(d) 5 units

(iv) The coordinates of THREE PALMS are
(a) (4, 6)
(b) (6, 4)
(c) (4, 4)
(d) (6, 6)
(v) The distance of THREE PALMS from Y axis is
(a) 4 units
(b) 5 units
(c) 6 units
(d) 7 units

29 Kumar has a rectangular Sketch - I, which he needs to draw on a coloured paper of length and breadth 32 units and 16 units respectively, using a plotter (Sketch - II). Plotter is a device which is attached to a computer like a printer It is used for drawing complicated sketches. Plotter accepts only positive coordinates where the point (0, 0) is the left-bottom corner of the paper. The sketch ABCD needs to be centrally aligned on the paper.



Sketch – 1



Sketch – 2

(i) What are the coordinates of A and B respectively (in sketch 2)?
(a) A (13, 10); B (19, 6)
(b) A (13, 10); B (19, 10)
(c) A (19, 6); B (13, 10)
(d) A (19, 6); B (13, 6)
(ii) What are the coordinates of C and D respectively (in sketch 2)?
(a) C (13, 10); D (19, 6)
(b) C (13, 10); D (19, 10)
(c) C (13, 10); D (13, 6)
(d) C (19, 6); D (13, 6)
(iii) The coordinates of point O (in sketch 2) is
(a) (0, 0)
(b) (16, 8)
(c) (8, 16)
(d) (16, 32)

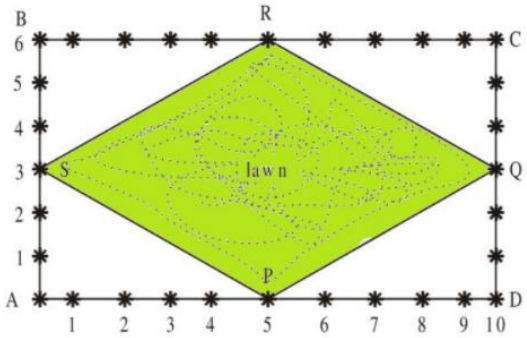
(iv) The point on the y-axis (in sketch 2) which is equidistant from the points B and C is

(a) (0, 8)
(b) (8, 0)
(c) (-8, 0)
(d) (0, -8)

(v) The point on the x-axis (in sketch 2) which is equidistant from the points C and D is

(a) (0, -16)
(b) (16, 0)
(c) (-16, 0)
(d) (0, 16)

30 The Class IX students of a secondary school in Krishinagar have been allotted a rectangular plot of land for their gardening activity. Sapling of Gulmohar are planted on the boundary at a distance of 1m from each other. There is a lawn PQRS in the ground as shown in below figure.



(i) What are the coordinates of C, taking A as origin?

(a) C (6, 10)
(b) C (10, 10)
(c) C (6, 6)
(d) C (10, 6)

(ii) What are the coordinates of R, taking A as origin?

(a) R (6, 5)
(b) R (5, 5)
(c) R (5, 6)
(d) R (6, 6)

(iii) Side of lawn is

(a) 4 units
(b) √34 units
(c) 34 units
(d) None

(iv) Shape of lawn is

(a) Rectangle
(b) Square
(c) Parallelogram
(d) Rhombus

(v) Area of lawn is
(a) 30 sq. units
(b) 60 sq. units
(c) 45 sq. units
(d) None

Answers

1 (b) Y – axis
2 (c) Zero
3 (b) Both Negative Real Numbers
4 (d) Fourth Quadrant
5 (a) X – Axis
6 (a) 4 Units
7 (d) (4, 5)
8 (b) Second Quadrant
9 (c) (-5, 3)
10 (c) Square
11 (d) First and Third
12 (d) Second and Fourth Quadrant
13 (c) First and Fourth Quadrant
14 (c) Third and Fourth Quadrant
15 (b) Negative side of X – Axis
16 (c) Positive side of Y – Axis
17 (c) Both X and Y axes
18 (c) $(0, 3\sqrt{3})$
19 (d) 8 units
20 (d) 8 units
21 (a) Both positive real numbers
22 (c) 6 units
23 (c) Third Quadrant
24 (a) Rectangle
25 (b) Different Axes
26 (i) (c) A (3, 5); B (7, 9)
(ii) (a) C (11, 5); D (7, 1)
(iii) (c) 8 units
(iv) (c) 8 units
(v) (a) (7, 5)
27 (i) (b) (2, 3)
(ii) (a) (2, -1)
(iii) (a) 4 units
(iv) (d) (6, 2)
(v) (b) Quadrant II
28 (i) (d) 5 units
(ii) (a) (5, 3)
(iii) (b) 3 units
(iv) (b) (6, 4)
(v) (c) 6 units
29 (i) (b) A (13, 10); B (19, 10)

	(ii)	(d)	C (19, 6); D (13, 6)
	(iii)	(b)	(16, 8)
	(iv)	(a)	(0, 8)
	(v)	(b)	(16, 0)
30	(i)	(d)	C (10, 6)
	(ii)	(c)	R (5, 6)
	(iii)	(b)	√34 units
	(iv)	(d)	Rhombus
	(v)	(a)	30 sq. units

CHAPTRER – 6
LINES AND ANGLES

GIST OF CHAPTER

- **Lines in a plane which do not intersect are called parallel lines and the distance between them is constant.**

- **A line which intersect two or more given lines in distinct points is called a transversal to the given lines.**

- **If two parallel lines are intersected by a transversal, then**

  (a) each pair of corresponding angles are equal.

  (b) each pair of alternate interior angles are equal.

  (c) sum of co-interior angles on the same side of the transversal are supplementary.

- **If two lines are intersected by a transversal and any one of the following point is true, then the lines are said to be parallel.**

  (a) If any pair of corresponding angles are equal.

  (b) If any pair of alternate angles are equal.

  (c) If sum of any pair of co-interior angles on the same side of a transversal is supplementary.

- **Two lines which are parallel to the same line are parallel to each other.**
- **Two lines which are perpendicular to the same line are parallel to each other.**

- **If a transversal intersects lines l and m in distinct points A and B. then the lines / and m are said to make an intercept AB on that transversal.**

- **Three or more points lying on the same line are called collinear points; otherwise they are called non-collinear points.**

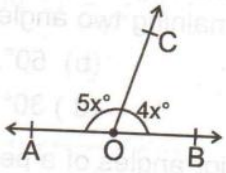
- **If the non-common arms of two adjacent angles form a line then these angles make a linear pair.**
- **If a ray stands on a line, then the sum of two adjacent angles so formed is 180°.**
- **If the sum of two adjacent angles is 180°, then the non-common arms of the angles form a line.**
- **If two lines intersect each other, then the vertically opposite angles are equal.**
- **The sum of the angles of a triangle is 180°.**
- **If a side of a triangle is produced, then the exterior angle so formed is equal to the sum of the two interior opposite angles.**

MULTIPLE CHOICE QUESTIONS

1. If two complementary angles are in the ratio of 11 : 7. then the angles are
(a) 55°, 35° (b) 50°, 40° (c) 45°, 45° (d) 30°, 60°

2. If the difference between two complementary angles is 20°, then the angles are
(a) 55°, 35° (b) 50°, 40° (c) 45°, 45° (d) 30°, 60°

3. In the given figure, angle x is

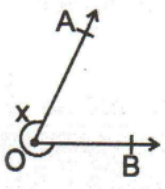


(a) 80° (b) 30° (c) 20° (d) 100°

4. In triangle ABC, ∠B = 45°, ∠C=55" and the bisector of ∠A meets BC at a point D. The measure of ∠ADB is

(a) 50° (b) 20° (c) 100° (d) 95°

5. In the given figure, angle x is



(a) Reflex angle (b) Obtuse angle (c) Acute angle (d) Straight angle

6. Two angles of a triangle are equal and the third angle is greater than each of these angles by 30°. Angles of the triangle are

(a) 30°, 30°, 120° (b) 50°, 50°, 80° (c) 80°, 80°, 20° (d) 60°, 60°, 60°

7. An exterior angle of a triangle is 115° and one of its interior opposite angle is 35°. The other two angles are

(a) 65°, 80° (b) 75°, 70° (c) 90°, 55° (d) 85°, 60°

8. If the angles of a triangle are in the ratio of 2:3:4. The angles are

(a) 40°, 60°, 80° (b) 80°, 80°, 20° (c) 50°, 30°, 100° (d) 60°, 60°, 60°

9. One of the angles of a triangle is 65°. If the difference of other two angles is 25°, the remaining two angles are

(a) 45°, 70° (b) 40°, 65° (c) 50°, 65° (d) 30°, 55°

10. The sum of the interior angles of a pentagon is

(a) 540° (b) 720° (c) 108° (d) 360°

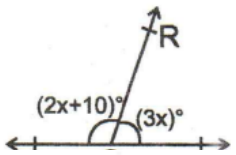
11. The lines perpendicular to the same line are _____ to each other.
(a) parallel (b) intersecting (c) perpendicular (d) dependent

12. one angle of a linear pair is double the other one, then their measures are

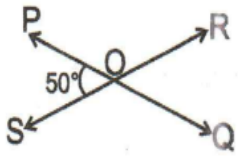
(a) 60°, 120° (b) 45°, 90° (c) 30°", 150° (d) 30°, 60°

13. ∠POR =(3x) ° and ∠QOR = (2x+10)°, then the value of x so that ∠POQ is a straight line is

(a) 34° (b) 24° (c) 28° (d) 54°

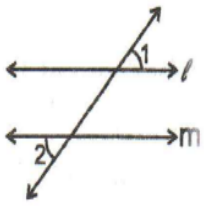


14 . PQ and RS are two intersecting lines. If ∠POS=50°, then ∠POR



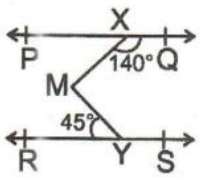
(A) 120° (b) 140° (c) 130° (d) 150°

15. In figure, ∠1 = 60° and ∠2 = $\frac{2}{3}$ of a right angle, then l and m will be



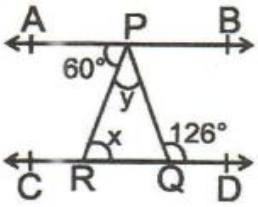
(a) intersecting lines (b) non-parallel lines
(c) parallel lines (d) none of these

16. If PQ || RS, ∠MXQ = 140° and ∠MYR = 45°, then the value of ∠XMY will be



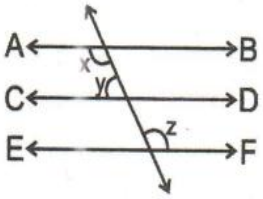
(a) 85° (b) 95° (c) 80° (d) 90°

17. If AB || CD, ∠APR = 60° and ∠PQD = 126°, then the value of 'y' is



(a) 76° (b) 66° (c) 56° (d) 86°

18. If AB || CD, CD || EF and y : z = 4 : 5. then the value of x will be



(a) 20° (b) 40° (c) 100° (d) 80°

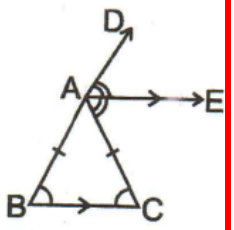
19. Each angle of an equilateral triangle is

(a) 45° (b) 60" (c) 55 (d) 70°

20. If one of the angles of a triangle is 130°, then the angle between the bisectors of the other two angles can be

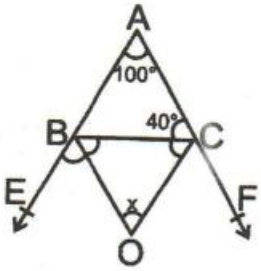
(a) 50° (b) 145° (c) 65° (d) 155°

21. In the figure ∠CAD = 110° AE||BC and AE bisects ∠CAD, then



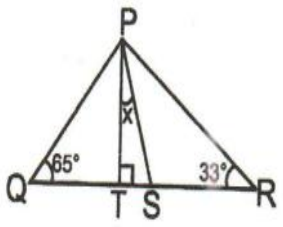
(a) 65° (b) 45° (c) 55° (d) 75°

22. In figure, BO and CO are the bisectors of ∠CBE and ∠BCF respectively. ∠BAC = 100°, ∠ACB= 40°, then the value of x is



(a) 40° (b) 60° (c) 50° (d) 70°

23. If PT ⊥ OR and PS is the bisector of ∠QPR. If ∠Q = 65° and ∠R = 33°, then x is

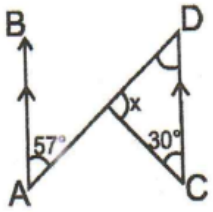


(a) 32° (b) 22° (c) 16° (d) 24°

24. If one angle of a triangle is equal to the sum of the other two angles, then the triangle is _____ triangle.

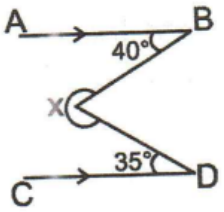
(a) an isosceles (b) an equilateral (c) an obtuse (d) a right

25 . If AB || CD then x is



(a) 39° (b) 57° (c) 93° (d) 30°

26. If AB|| CD, then x is

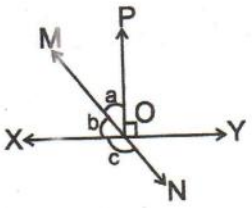


(a) 385° (b) 70° (c) 285° (d) 100°

27. The greatest angle of a triangle is 30° more than the least and the third angle is 15° less than the greatest. Then the angles of the triangle are.

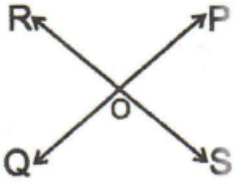
(a) 40° , 60°, 80° (b) 45°, 60°, 75° (c) 50° 50°, 80° (d) 30°, 60° , 90°

28. In the figure, lines XY and MN intersect at O. if ∠POY = 90° and a : b = 2 : 3, then c is



(a) 126° (b) 116° (c) 106° (d) 96°

29. In the figure ∠POR : ∠ROQ = 5 : 7 then ∠ SOQ is



(a) 105° (b) 75° (c) 50° (d) 30°

30 An exterior angle of a triangle is 105° and its two interior opposite angles are equal each of these equal angle is

(a) 37.5° (b) 72.5° (c) 52.5° (d) 75°

CREATIVE AND CRITICAL THINKING QUESTION

Q1. Harikrishna and Himadri are observing the flower petal given in figure (a) Harikrishnaasked Himadri that the flower petals are following some mathematical pattern as given in figure (b). They have some questions for this pattern, help these two kids to solve their questions

Figure (a)

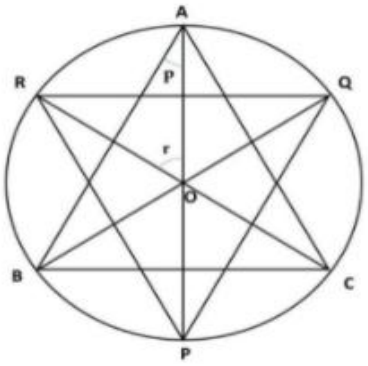


Figure (b)

Q1. How many line segment are there in diagram (b) ?

(a) 6 (b) 9 (c) 12 (d) 10

Q2. How many vertices are there in figure (b) ?

(a) 6 (b) 9 (c) 12 (d) 10

Q3. Line segment AP, CR and BQ are called _____

(a) linear (b) concurrent (c) congruent (d) parallel

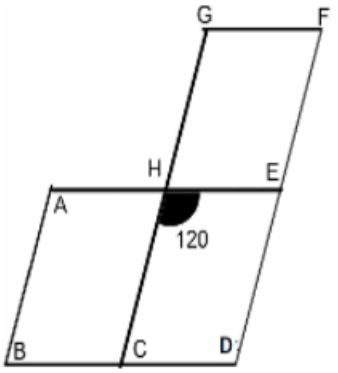
Q4.line segment parallel to PQ is

(a)AB (b) RQ (c) RP (d) AC

Q5. If point O is a centre of the circle then diameter of the circle is

(a) AB (b) QR (c) AP (d) AC

Q2. In the school play ground eight students of class 9^{th} are playing a game during sports period they are standing on the points given by English alphabets as given in the following figure. Ghreesa is observing the students and thinking about it. And trying to solve the following questions .



Q1. How many quadrilateral are there in this diagram ?

(a)3 (b) 4 (c) 5 (d) 6

Q2. Corresponding angle of angle ∠ ABC is

(a)∠ HCD (b) ∠GHE (c) ∠GFE (d) ∠BAH

Q3. Alternate angle of angle ∠ FGH is

(b) ∠ HCB (b) ∠GHE (c) ∠GFE (d) ∠BAH

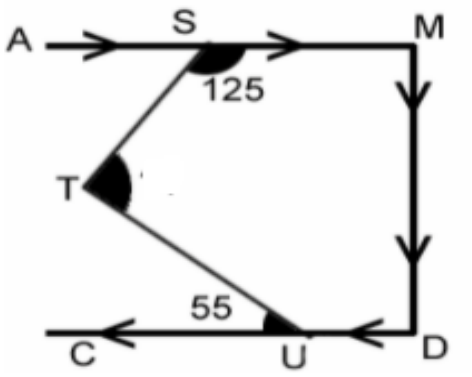
Q4. Linear pair angle of ∠GHE is

(a) ∠EHC (b) ∠GFE (c) ∠ABC (d) ∠BCH

Q5. Measurement of ∠ABC

(a) 30^0 (b) 60^0 (c) 90^0 (d) 120^0

Q3. A route from place A to place C is shown in the figure . to avoid traffic on the highway AM , a road is cut through S via T to reach C by authorities, Highway AM parallel to Highway CD if ∠MST =125^0, ∠CUT = 55^0 . Give the answer of following question using this information.



Q1. The measurement of ∠AST is ?

(a) 55^0 (b) 125^0 (c) 180^0 (d) 90^0

Q2. The measurement of ∠TUD is ?

(a) 55^0 (b) 125^0 (c) 180^0 (d) 90^0

Q3. The measurement of ∠STU is ?

(a) 55^0 (b) 125^0 (c) 110^0 (d) 90^0

Q4. If ∠SMD = 90^0 then measurement of ∠UDM is

(a) 55^0 (b) 125^0 (c) 110^0 (d) 90^0

Q5. The measurement of Reflex ∠STU is ?

(a) 155^0 (b) 250^0 (c) 110^0 (d) 180^0

CHAPTER – 12
HERON'S FORMULA

GIST OF CHAPTER

- Area of a triangle = $\frac{1}{2}$ x base x height sq. units.
- Heron's formula for the area of a triangle, whose sides are a, b and c units,

  s-semi-perimeter = $\frac{a+b+c}{2}$

  Area of a triangle = $\sqrt{s(s-a)(s-b)(s-c)}$ sq. units.
- Area of a right triangle = $\frac{1}{2}$ x b x a sq units.

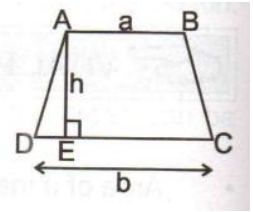
  where b and a are two sides of a right triangle.
- Area of an equilateral triangle whose sides are 'a' units

  Area = $\frac{\sqrt{3}}{4}$ a^2 sq. units.
- Altitude of an equilateral triangle whose sides are 'a' units

  Altitude = $\frac{\sqrt{3}}{2}$ a units.
- Area of an isosceles triangle = $\frac{a}{2}\sqrt{x^2-\frac{a^2}{4}}$ sq. units

  where AB = AC = x and BC= a units.
- Perimeter of rhombus = 4 x side.
- Area of rhombus = $\frac{1}{2}$ x product of its two diagonals.
- Area of trapezium = $\frac{1}{2}$ x sum of parallel sides distance between them

  Area of trapezium = $\frac{1}{2}$ x (a + b) x h sq. units



MULTIPLE CHOICE QUESTIONS

1. The semi-perimeter of the triangle is 6 cm. If sides are of length 3 cm, 4 cm and 5 cm, then area of triangle is

(a) 6 sq. cm (b) 7 sq cm (c) 5 sq. cm (d) 8 sq. cm

2. The area (in square units) of an isosceles triangle whose base is 'a' and equal sides are of length 'b' is

(a) $\frac{a}{4}\sqrt{4b^2 - a^2}$ (b) $\frac{b}{4}\sqrt{4a^2 - b^2}$ (c) $\frac{b}{4}\sqrt{4a^2 - b}$ (d) $\frac{a}{2}\sqrt{4b^2 - a^2}$

3. Area of an equilateral triangle with side a is

(a) $\frac{\sqrt{3}}{2}a^2$ sq. units (b) $\frac{\sqrt{3}}{2}a$ sq. units (c) $\frac{\sqrt{3}}{4}a^2$ sq. units (d) $\frac{\sqrt{3}}{4}a^2$ sq. units

4. Area of triangle with sides a, b, c and semi-perimeters is given as

(a) $\sqrt{s(s-a)\{s-b)\{s-c)}$ (b) $\frac{1}{2}$ (a + b + c) (c) $\frac{1}{2}$ (2s + a) (d) none of these

5. The longer side of a rectangular hall is 24 m, and the length of its diagonal is 26 m. The semi-perimeter of ▲ABC is

(a) 60 m (b) 40 m (c) 30 m (d) 42 m

6. The height of an equilateral triangle measure 9 cm. Its area is (take $\sqrt{3}$ = 1.732)

(a) 46.76 cm^2 (b) 40.76 cm^2 (c) 42.42 cm^2 (d) 43.2 cm^2

7. The side of an equilateral triangle, whose area is $\sqrt{3}$ cm^2 is

(a) 8 cm (b) 2 cm (c) 4 cm (d) 16 cm

8. Three sides of a triangle are 6 cm, 8 cm and 10 cm. Its area is given by

(a) 96 sq. cm (b) 48 sq. cm (c) $\sqrt{24}$ sq. cm (d) 24 sq. cm

9. The sides of a triangle are in the ratio 3 : 5 : 7. If the perimeter of the triangle is 60cm, then its area is

(a) $60\sqrt{3}$ sq. cm (b) $30\sqrt{3}$ sq. cm (c) $15\sqrt{3}$ sq. cm (d) $120\sqrt{3}$ sq. cm

10. An umbrella is made by stitching 12 triangular pieces of cloth, each measuring 50 cm x 20 cm x 50 cm. The area of the cloth used in it is

(a) 58883 cm^2 (b) 5860 cm^2 (c) 5879 cm^2 (d) 5813 cm^2

11. The area of an isosceles triangle is 12 sq cm. If one of the equal sides is 5 cm, then the length of the base is the equal

(a) 4 cm (b) 6 cm (c) 8 cm (d) both b and c

12. The area of a triangle whose sides are 8 cm, 19 cm and 15 cm is

(a) 96 sq. cm (b) $6\sqrt{91}$sq cm (c) 86 sq. cm (d) $12\sqrt{91}$ sq cm

13. The sides of a triangle are in the ratio of 12:17:25. If the perimeter of the triangle is 540 cm, then its longest side is

(a) 170 cm (b) 120 cm (c) 250 cm (d) 220 cm

14. The perimeter of an isosceles triangle is 30 cm. If one of the equal side is 12 cm, then the length of the base is

(a) 8 cm (b) 6 cm (c) 9 cm (d) 12 cm

15. The perimeter of an equilateral triangle is 180 cm. its area is

(a) 900 sq cm (b) $900\sqrt{2}$ sq cm (c) 900 $\sqrt{3}$ sq cm (d) 920 sq cm

16. If $\angle B = 90^0$, BC = 40 m , AB = 9 m AD = 28 m and DC = 15 m, then the area of ▲ADC is

(a) 112 m^2 (b) 126 m^2 (c) 128 m^2 (d) 154 m^2

17. The base of a right triangle is 8 cm and hypotenuse is 17 cm s

(a) 60 cm^2 (b) 60 cm^2 (c) 48 cm^2 (d) 80cm^2

18. An isosceles right mangle has area 8 sq.cm. The length of its hypotenuse is

(a)$\sqrt{32}$ cm (b) $\sqrt{16}$ cm (c) $\sqrt{48}$ cm (d) $\sqrt{24}$ cm

19. The perimeter of an equilateral triangle is 90m Its area is

(b) $10\sqrt{3}$ m^2 (d) $225\sqrt{3}$ m^2 (c) $20\sqrt{3}$ m^2 (d) $100\sqrt{3}$ m^2

20. The sides of a triangle are 56 cm, 60 cm and 52 cm long, its area is.

(a) 1322 sq. cm (b) 1311 sq.cm (c) 1344 sq. cm (d) 1392 sq. cm

21. The area of an equilateral triangle with side $6\sqrt{3}$ cm is

(a) 46.764 sq.cm (b) 3.468 sq.cm (c) 0.866 sq.cm (d) 1.732 sq. cm

22. The length of each side of an equilateral triangle having an area of $12\sqrt{3}$cm² is

(a) 8 cm (b) 4 cm (c) 36 cm (d) $4\sqrt{3}$ cm

23. If the area of an equilateral triangle is $16\sqrt{3}$ sq.cm, then the perimeter. of the triangle is

(a) 48 cm (b) 12 cm (c) 24 cm (d) 306 cm

24 The sides of a triangle are 35 cm, 54 cm and 61 cm respectively The length of its longest altitude is

(a) $16\sqrt{5}$ cm (b) $10\sqrt{5}$ cm (c) $24\sqrt{5}$ cm (d) $28\sqrt{5}$ cm

25. The area of an isosceles triangle having base 2 cm and the length of one of the equal sides 4 cm is

(a) $\sqrt{15}$ sq.cm (b) $\sqrt{\frac{15}{2}}$ sq.cm (c) $2\sqrt{15}$ cm² (d) $4\sqrt{15}$ sq.cm

26. The edges of a triangular board are 6 cm, 8 cm and 10 cm. The cost of painting at the rate of 9 paise per cm² is

(a) 2.00 (b) 2.48 (c) 2.16 (d) 3.00

27. The area of right angled triangle whose base is 1.2 m and hypotenuse is 3.7 m is

(a) 4.2 m² (b) 3 m² (c) 2.1 m² (d) 6 m²

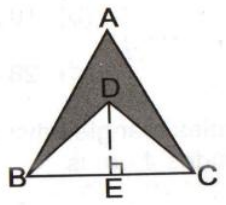
28. The sides of a triangle are 25 cm, 39 cm and 56 cm, the altitude corresponding to the shortest side is

(a) 32 cm (b) 40 cm (c) 33 cm (d) 33.6 cm

29.The parallel side of a trapezium are 25 cm and 11 cm, while its non parallel sides are 15 cm and 13 cm, then the area of trapezium is

(a) 210 cm^2 (b) 216 cm^2 (c) 500 cm^2 (d) 464 cm^2

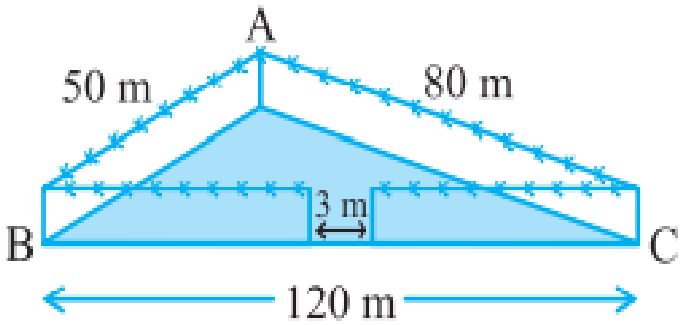
30. In the figure, DE=5 cm, BC=9 cm. The area of the larger triangle is 50 cm^2, then the area of the shaded region is



(a) 27.5 cm^2 (c) 24 cm^2 (b) 30 cm^2 (d) 25 cm^2

CREATIVE AND CRITICAL THINKING QUESTION

Q1. A triangular public park ABC has sides 120m, 80m and 50m . A gardener has to put a fence all around it and also plant grass inside. 3m wide for a gate on one side. Municipal corporation construct a 1 m wide foot path out side the park and 1 m wide flower bed inside the park along with side of park



Q1. What is the perimeter of triangular park ?

(a) 150m (b) 200 m (c) 250m (d) 300 m

Q2.What is the Area of triangular park ?

(a) 1352.36 m^2 (b) 1452.36 m^2 (c) 1552.36 m^2 (d)1652.36 m^2

Q3.What is the cost of fencing it with barbed wire at the rate of Rs 20 per metre ?

(a) Rs 5000 (b) Rs 5500 (c) Rs 4500 (d) Rs 5050

Q4. Find the perimeter of foot path

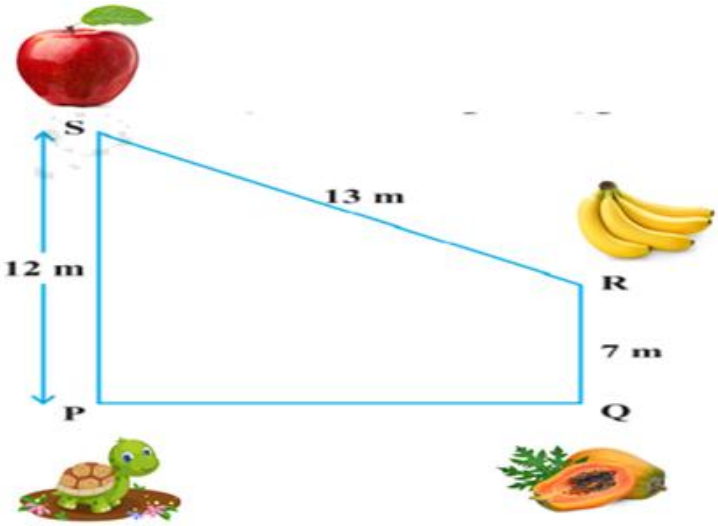
(a) 250m (b) 256 m (c) 260 m (d) 265 m

Q5. Find the perimeter of inner side of flower bed in the garden

(a)250m (b) 256 m (c) 244 m (d) 265 m

Q2. A tortoise is starts walking from point P to point Q and from point Q to point R and point R to point S and point S to again point P. and eaten all fruits as given in the diagram .

P → Q → R → S → P



Q1. Calculate the shortest distance between point P and papaya fruit.

(a) 12m (b) 7 m (c) 19 m (d) 20 m

Q2. Calculate the distance covered by tortoise from point P to banana fruit.

(a) 12 m (b) 7 m (c) 19 m (d) 20 m

Q3. If tortoise walks from point P to point Q and point Q to point R and point R to point P again. Then calculate the enclosed area.

(a) 40 cm^2 (b) 84 cm^2 (c) 19 cm^2 (d) 25 cm^2

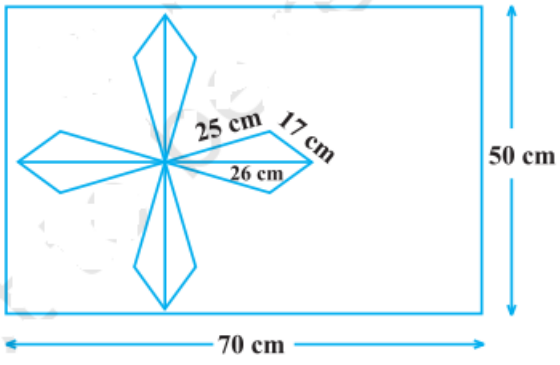
Q4. Find the total distance covered by tortoise after eating all fruits and come back on point P

(a) 42 m (b) 44 m (c) 46 m (d) 48 m

Q5. Calculate the distance between papaya fruit and apple fruit.

(a) $12\sqrt{2}$ m (b) $24\sqrt{2}$ m (c) $12\sqrt{3}$ m (d) $24\sqrt{3}$ m

Q3. A design is made on a rectangular tile of dimensions 50 cm X 70 cm as shown in the given diagram. The design shows 8 triangles, each of side 26cm, 17cm, and 25cm . Find the total area of the design and the remaining area of tile.



Q1. How many triangles are there in the diagram?

(a)4 (b) 6 (c) 8 (d) 10

Q2. Area of given rectangle is

(a) 3000 cm^2 (b) 3500 cm^2 (c) 1200 cm^2 (d) 2000 cm^2

Q3. Find the Perimeter of rectangular tile.

(a) 280 cm (b) 200 cm (c) 120 cm (d) 240 cm

Q4. Find the area of each triangular region .

(a) 240 cm^2 (b) 204 cm^2 (c) 420 cm^2 (d) 402 cm^2

Q5. Find the area of each kite shape.

(a) 408 cm^2 (b) 400 cm^2 (c) 240 cm^2 (d) 240 cm^2

Class IX Mathematics
Chapter 14 Statistics

Data

The facts or figures, which are numerical or otherwise, collected with a definite purpose are called *data*.

Kinds of Data

Primary data, Secondary data, Raw data, Array, Ungrouped data, Grouped data.

Representation of data

Frequency distribution table, Pictograph, Pie chart, Bar graph, Histogram

Kinds of class intervals

Continuous Classes							Takes value	
True LL	LL	**Class**	UL	True UL	Class Mark	Class Size	from	To
0	0	**0-10**	10	10	5	10	0	9.9
10	10	**10-20**	20	20	15	10	10	19.9
20	20	**20-30**	30	30	25	10	20	29.9
30	30	**30-40**	40	40	35	10	30	39.9
40	40	**40-50**	50	50	45	10	40	49.9
Non Continuous Classes							Takes value	
True LL	LL	**Class**	UL	True UL	Class Mark	Class Size	from	To
-0.5	0	0-9	9	9.5	4.5	10	0	9
9.5	10	10-19	19	19.5	14.5	10	10	19
19.5	20	20-29	29	29.5	24.5	10	20	29
29.5	30	30-39	39	39.5	34.5	10	30	39
39.5	40	40-49	49	49.5	44.5	10	40	49

Important Formula

Class mark = (Upper limit + Lower limit)/2

Class size = True Upper limit – True Lower limit

Class size = Difference between the upper/lower limits of two consecutive classes

Class size = Difference between the class marks of two consecutive classes

Lower limit = Class mark – half class size

Upper limit = Class mark + half class size

True lower limit of any class= (LL of the class + UL of the previous class)/2

True upper limit of any class= (UL of the class + LL of the next class)/2

Bar graph is used to represent an un grouped data.

Histogram is used to represent a grouped data.

Multiple choice Questions

1 Class mark of any class interval is

(a) (Lower limit + Upper limit)/2

(b) (Lower limit - Upper limit)/2

(c) (Lower limit + Upper limit)/3

(d) (Lower limit - Upper limit)/3

2 Bar graph is used to represent

(a) Ungrouped data
(b) Grouped data
(c) Both Grouped and Ungrouped data
(d) None

3 Histogram is used to represent
(a) Ungrouped data
(b) Grouped data
(c) Both Grouped and Ungrouped data
(d) None

4 Class Interval 10 -20 takes values from
(a) 10 to 20
(b) 10 to 19.9
(c) 9.5 to 20.5
(d) None

5 Class Interval 10 -19 takes values from
(a) 10 to 20
(b) 10 to 19
(c) 9.5 to 20.5
(d) None

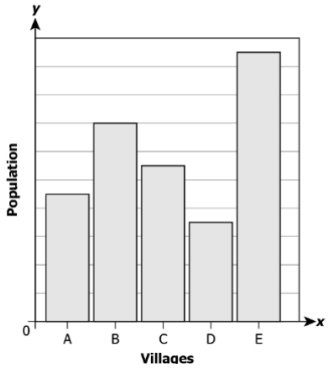
6 Range of a data is
(a) Lower limit – Upper limit
(b) Upper limit – Lower limit
(c) Maximum Observation – Minimum Observation
(d) None

7 The data which is arranged in the ascending order is called
(a) Raw data
(b) Grouped data
(c) Ungrouped data
(d) Array

8 A student recorded the population of some villages as shown below

Village	Population
A	450
B	700
C	550
D	350
E	950

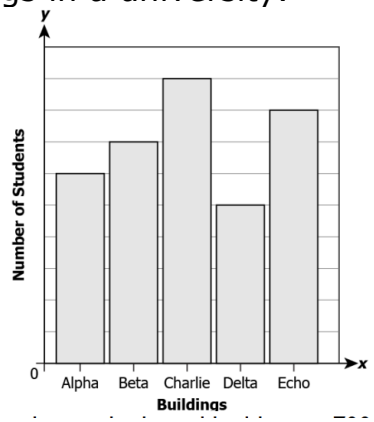
The student then represented the data as shown below.



Which of the following would be the scale used on the *y* – axis?

(a) 1 unit = 10 people
(b) 1 unit = 50 people
(c) 1 unit = 100 people
(d) 1 unit = 500 people

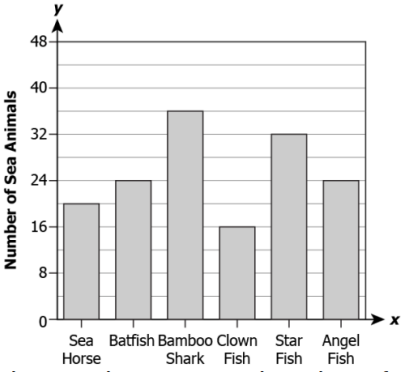
9 The bar graph below shows the number of students residing at different hostel buildings in a university.



If the total number of students residing in the hostel buildings is 700, how many students reside in Charlie building?

(a) 90
(b) 135
(c) 180
(d) 225

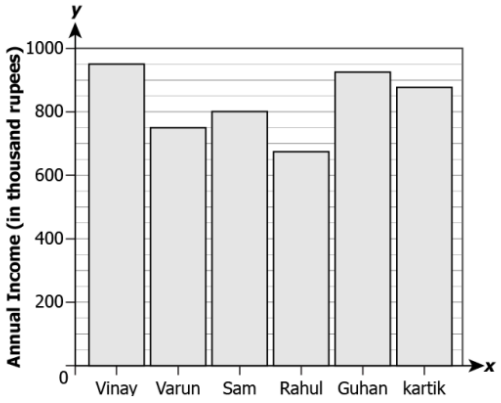
10 The bar graph below shows the number of sea animals in a large aquarium.



How many more sea horses are there in the aquarium than clown fishes?

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

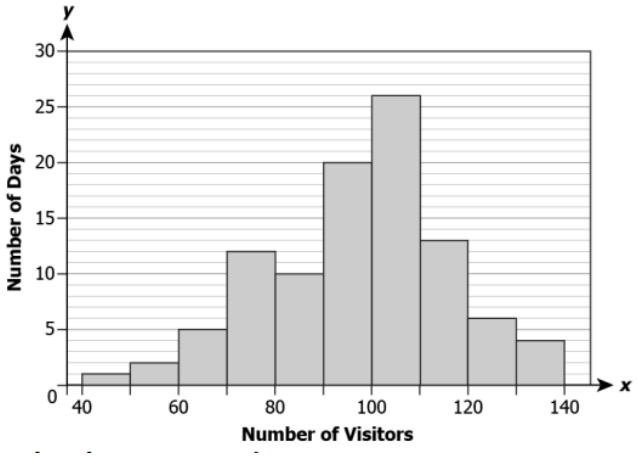
11 The bar graph shows the annual income of a group of friends.



Who earns the most among the group of friends and how much more does he earn than the one who earns the least?

(a) Vinay; Rs 200000
(b) Vinay; Rs 275000
(c) Guhan; Rs 175000
(d) Guhan; Rs 250000

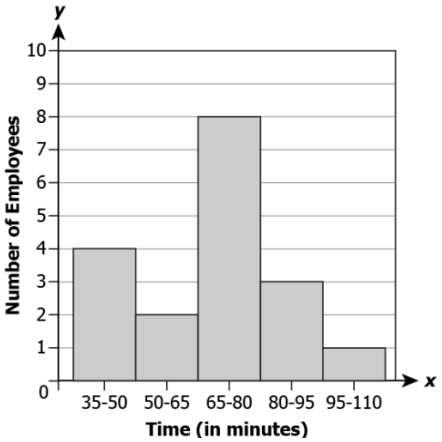
12 The histogram below shows the number of visitors in a museum on different number of days:



Which of these is correct about the histogram?

(a) There were about 80-90 visitors for 12 days at the museum.
(b) There were about 60-70 visitors for 5 days at the museum.
(c) There were about 120-140 visitors for 6 days at the museum.
(d) There were about 100-120 visitors for 26 days at the museum

13 The histogram below shows the daily commute time, in minutes, for 18 employees of an office



Which of these is NOT correct about the histogram?

(a) 4 employees take 35-50 minutes to commute to office
(b) 8 employees take 65-95 minutes to commute to office
(c) 6 employees take less than 65 minutes to commute to office.
(d) 4 employees take more than 80 minutes to commute to office

14 The marks obtained by 17 students in a mathematics test (out of 100) are given below:
91, 82, 100, 100, 96, 65, 82, 76, 79, 90, 46, 64, 72, 68, 66, 48, 49.
The range of the data is:

(a) 46
(b) 54
(c) 90
(d) 100

15 The class-mark of the class 130-150 is

(a) 130
(b) 135
(c) 140
(d) 145

16 In a frequency distribution, the mid value of a class is 10 and the width of the class is 6. The lower limit of the class is

(a) 6
(b) 7
(c) 8
(d) 12

17 The width of each of five continuous classes in a frequency distribution is 5 and the lower class-limit of the lowest class is 10. The upper class-limit of the highest class is

(a) 15
(b) 25
(c) 35
(d) 40

18 Let m be the mid-point and n be the upper class limit of a class in a continuous frequency distribution. The lower class limit of the class is

(a) 2m + n

(b) 2m – n
(c) m – n
(d) m – 2n

19 The class marks of a frequency distribution are given as follows: 15, 20, 25, ... The class corresponding to the class mark 20 is
(a) 12.5 – 17.5
(b) 17.5 – 22.5
(c) 18.5 – 21.5
(d) 19.5 – 20.5

20 In the class intervals 10-20, 20-30, the number 20 is included in
(a) 10-20
(b) 20-30
(c) both the intervals
(d) none of these intervals

21 A grouped frequency table with class intervals of equal sizes using 250-270 (270 not included in this interval) as one of the class interval is constructed for the following data:
268, 220, 368, 258, 242, 310, 272, 342, 310, 290, 300, 320, 319, 304, 402, 318, 406, 292, 354, 278, 210, 240, 330, 316, 406, 215, 258, 236.
The frequency of the class 310-330 is
(a) 4
(b) 5
(c) 6
(d) 7

22 A grouped frequency distribution table with classes of equal sizes using 63-72 (72 included) as one of the class is constructed for the following data:
30, 32, 45, 54, 74, 78, 108, 112, 66, 76, 88, 40, 14, 20, 15, 35, 44, 66, 75, 84, 95, 96, 102, 110, 88, 74, 112, 14, 34, 44.
The number of classes in the distribution will be
(a) 9
(b) 10
(c) 11
(d) 12

23 To draw a histogram to represent the following frequency distribution: the adjusted frequency for the class 25-45 is

Class	5-10	10-15	15-25	25-45	45-75
Frequency	6	12	10	8	15

(a) 6
(b) 5
(c) 3
(d) 2

24 The class-mark of the class 140-150 is
(a) 130
(b) 135
(c) 140
(d) 145

25 Which of the following is not a formula to find the class size of the class intervals with the uniform width?

(a) Class size = True Upper limit – True Lower limit

(b) Class size = Difference between the upper limits of two consecutive classes

(c) Class size = Difference between the class marks of two consecutive classes

(d) None

Case study based questions
(Answer any four sub parts)

26 The COVID-19 pandemic, also known as the coronavirus pandemic, is an ongoing pandemic of coronavirus disease 2019 (COVID-19) caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). It was first identified in December 2019 in Wuhan, China.
During survey, the ages of 80 patients infected by COVID and admitted in the one of the City hospital were recorded and the collected data is represented in the frequency distribution table.

Age (in yrs)	No. of patients
5 – 15	6
15 – 25	11
25 – 35	21
35 – 45	23
45 – 55	14
55 – 65	5

Based on the information, answer the following questions :

(i) The class interval with highest frequency is

(a) 45 – 55

(b) 35 – 45

(c) 25 – 35

(d) 15 - 25

(ii) Which age group was affected the least?

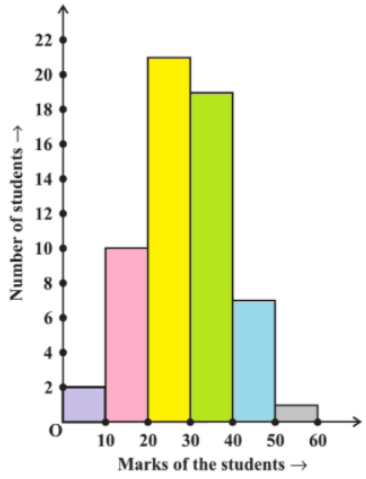
(a) 35 – 45

(b) 25 – 35

(c) 55 – 65

(d) 45 - 55
(iii) Which age group was affected the most?
(a) 35 – 45
(b) 25 – 35
(c) 15 - 25
(d) 45 – 55
(iv) How many patients of the age 45 years and above were admitted?
(a) 61
(b) 19
(c) 14
(d) 23
(v) How many patients of the age 35 years and less were admitted?
(a) 17
(b) 38
(c) 61
(d) 41

27 Anil is a Mathematics teacher in Hyderabad. After Periodic test 3, he asks students to collect the Mathematics marks of all the students of Class IX- A, B and C. A student is able to collect marks from some students. Rekha scored least mark 6 in the class and Ram scored highest marks 59 in the class. He prepares the frequency distribution table using the collected marks and draws Histogram
using the table as shown in adjoining figure.



(i) What is the width of the class?
(a) 10
(b) 15
(c) 5
(d) None of these
(ii) What is the total number of students in Histogram?
(a) 50
(b) 60
(c) 65
(d) None of these

(iii) How many students scored 50% and above marks?
(a) 19
(b) 26
(c) 27
(d) None of these
(iv) How many students scored less than 50% marks?
(a) 19
(b) 26
(c) 27
(d) None of these
(v) What is the range of the collected marks?
(a) 60
(b) 59
(c) 53
(d) None of these

28 A group of students decided to make a project on Statistics. They are collecting the heights (in cm) of their 51 girls of Class IX-A, B and C of their school. After collecting the data, they arranged the data in the following frequency distribution table form:

Height (in cm)	Number of girls
135 – 140	4
140 – 145	7
145 – 150	18
150 – 155	11
155 – 160	6
160 – 165	5

Based on the information, answer the following questions:

(i) The class interval with highest frequency is
(a) 145-150
(b) 150-155
(c) 140-145
(d) 155-160
(ii) What is the width of the class?
(a) 10
(b) 15
(c) 5
(d) none of these
(iii) How many students of the height 150 cm and below are there?

(a) 40
(b) 29
(c) 18
(d) 22

(iv) How many students of the height 145 cm and above are there?

(a) 40
(b) 29
(c) 18
(d) 22

(v) How many students of the height more than 145 cm but less than 155 are there?

(a) 40
(b) 29
(c) 18
(d) 22

29 A Mathematics teacher asks students to collect the marks of Mathematics in Half yearly exam. She instructed to all the students to prepare frequency distribution table using the data collected. Ram collected the following marks (out of 50) obtained in Mathematics by 60 students of Class IX

21, 10, 30, 22, 33, 5, 37, 12, 25, 42, 15, 39, 26, 32, 18, 27, 28, 19, 29, 35, 31, 24, 36, 18, 20, 38, 22, 44, 16, 24, 10, 27, 39, 28, 49, 29, 32, 23, 31, 21, 34, 22, 23, 36, 24, 36, 33, 47, 48, 50, 39, 20, 7, 16, 36, 45, 47, 30, 22, 17.

Groups	Tally Marks	Frequency
0-10	II	2
10-20	𝍸 𝍸	10
20-30	𝍸 𝍸 𝍸 𝍸 I	21
30-40	𝍸 𝍸 𝍸 IIII	19
40-50	𝍸 II	7
50-60	I	1
	Total	60

(i) How many students scored more than 20 but less than 30?

(a) 20
(b) 21
(c) 22
(d) 23

(ii) How many students scored less than 20 marks?

(a) 10
(b) 11
(c) 12
(d) 14

(iii) How many students scored 60% or more marks?

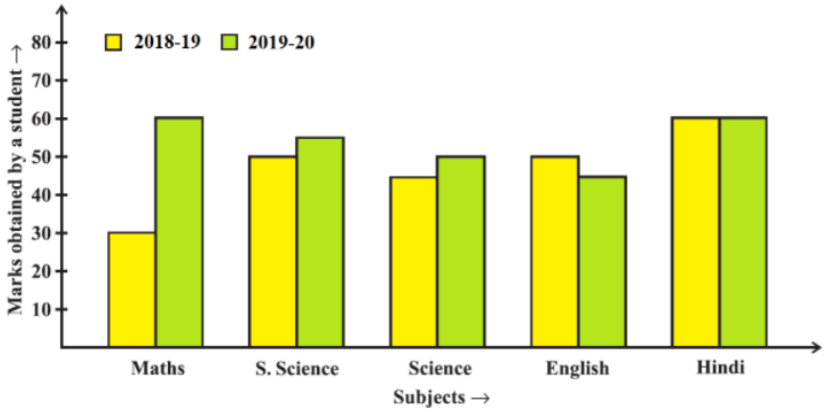
(a) 20
(b) 25
(c) 26
(d) 27

(iv) What is the class size of the classes?

(a) 10

(b) 5
(c) 15
(d) 20
(v) What is the class mark of the class interval 30 – 40?
(a) 30
(b) 35
(c) 40
(d) 70

30 The Class teacher of Class X preparing result analysis of a student. She compares the marks of a student obtained (out of 100) in Class IX (2018-19) and Class X (2019-20) using the double bar graph as shown below:



(i) In which subject has the performance improved the most?
(a) Maths
(b) Social Science
(c) Science
(d) English
(ii) In which subject has the performance deteriorated?
(a) Maths
(b) Social Science
(c) Science
(d) English
(iii) In which subject is the performance at par?
(a) Hindi
(b) Maths
(c) Science
(d) English
(iv) What is the difference in Maths Subject?
(a) 5
(b) 30
(c) 0
(d) 10
(v) What is the percentage of marks obtained by a student in Class X (2019-20)?
(a) 60%
(b) 55%

(c) 54%
(d) 65%

Answers

1	(a)	(Lower limit + Upper limit)/2	
2	(a)	Ungrouped data	
3	(b)	Grouped data	
4	(b)	10 to 19.9	
5	(b)	10 to 19	
6	(c)	Maximum observation – Minimum observation	
7	(d)	Array	
8	(c)	1 unit = 100 people	
9	(c)	180	
10	(b)	4	
11	(b)	Vinay; Rs 275000	
12	(b)	There were about 60-70 visitors for 5 days at the museum.	
13	(b)	8 employees take 65-95 minutes to commute to office	
14	(b)	54	
15	(c)	140	
16	(b)	7	
17	(c)	35	
18	(b)	2m – n	
19	(b)	17.5 – 22.5	
20	(b)	20 – 30	
21	(c)	26	
22	(d)	12	
23	(d)	2	
24	(d)	145	
25	(d)	None	
26	(i)	(b)	35 – 45
	(ii)	(c)	55 – 65
	(iii)	(b)	35 – 45
	(iv)	(b)	19
	(v)	(b)	38
27	(i)	(a)	10
	(ii)	(b)	60
	(iii)	(c)	27
	(iv)	(d)	None
	(v)	(c)	53
28	(i)	(a)	145 – 150
	(ii)	(c)	5
	(iii)	(b)	29
	(iv)	(a)	40
	(v)	(b)	29
29	(i)	(b)	21
	(ii)	(c)	12
	(iii)	(d)	27
	(iv)	(a)	10

	(v)	(b)	35
30	(i)	(a)	Maths
	(ii)	(d)	English
	(iii)	(a)	Hindi
	(iv)	(b)	30
	(v)	(c)	54%

Class :9

Triangle

MCQ

Q.1. In ΔABC, BC = AB and ∠B = 80°. Then ∠A is equal to:

a) 80^{o}
b) 40^{o}
c) 50^{o}
d) 100^{o}

Q.2. In Δ$ABC \cong$ ΔLKM,then side of ΔLKM equal to side AC of ΔABC is

a) LK
b) KM
c) LM
d) None

Q.3. All the medians of a triangle are equal in case of a:

a) Equilateral triangle
b) Right angled triangle
c) Scalene triangle
d) Isosceles triangle

Q.4. In a right triangle, the longest side is:

a) Perpendicular
b) Hypotenuse
c) Base
d) None of the above

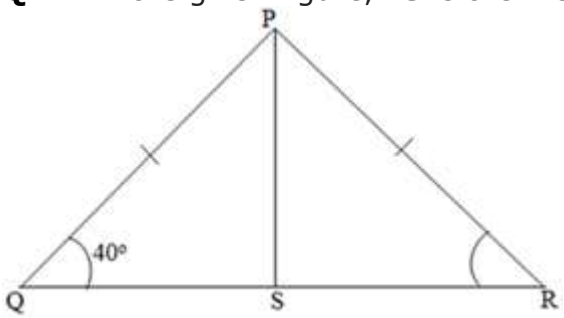
Q.5. In Δ ABC, AB = AC and ∠B = 50°. Then ∠C is equal to

a) 40°
b) 50°
c) 80°
d) 130°

Q.6. Which of the following is not a criterion for congruence of triangle?

a) SAS
b) SSS
c) RHS
d) SSA

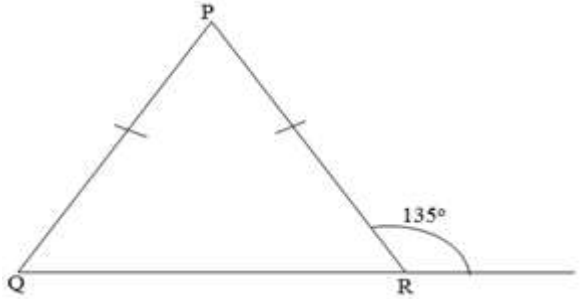
Q.7. In the given figure, PS is the median then ∠QPS?



a) 50°
b) 40°
c) 80°
d) 90°

Q.8. In ΔPQR≅ ΔEFD,then ∠E
a) ∠P
b) ∠Q
c) ∠R
d) None

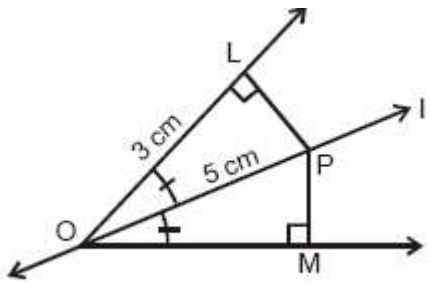
Q.9. In the given figure, if the exterior angle is 135° then ∠P is:



a) 45°
b) 60°
c) 90°
d) 80°

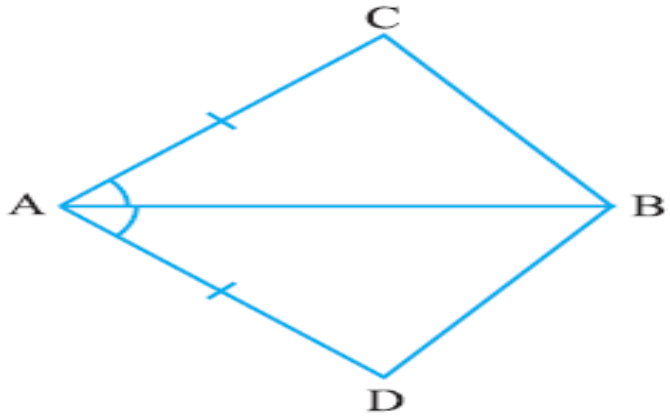
Q.10. Two sides of a triangle are of length 5 cm and 1.5 cm. The length of the third side of the triangle cannot be:
a) 3.6 cm
b) 4.1 cm
c) 6.9 cm
d) 3.8cm

Q.11. In the given figure, find PM



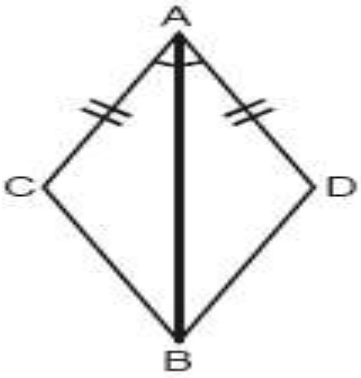
a) 3 cm
b) 4 cm
c) 5 cm
d) 2 cm

Q.12. In quadrilateral ACBD, AC = AD and AB bisects ∠ A (see Fig.). Show that Δ ABC ≅ Δ ABD. What can you say about BC and BD?



a) BC ≠ BD
b) BC>BD
c) BC<BD
d) BC=BD

Q.13. In the given figure, the congruency rule used in proving ∠ACD ≅ ∠ADB is



a) SAS
b) SSS
c) RHS
d) SSA

Q.14. In a triangle PQR if ∠QPR = 80° and PQ = PR, then ∠R and ∠Q are
a) 80°, 70°
b) 50°, 50°
c) 70°, 80°
d) 80°, 80°

Q.15. In two triangles ABC and DEF, AB = DE, BC = DF and AC = EF, then
a) ΔABC ≅ ΔDEF
b) ΔABC Δ ΔEFD
c) ΔABC ≅ ΔEDF
d) None

Q.16. If ABC and DBC are two isosceles triangles on the same base BC. Then:
a) ∠ABD = ∠ACD
b) ∠ABD > ∠ACD
c) ∠ABD < ∠ACD
d) None

Q.17. If ABC is an equilateral triangle, then each angle equals to:
a) 90°
B)180°
c) 120°
d) 60°

Q.18. If AD is an altitude of an isosceles triangle ABC in which AB = AC. Then:
a) BD=CD
b) BD>CD
c) BD<CD
d) None

Q.19. In ΔABC and ΔPQR if ∠A=∠R, ∠B=∠P and AB=RP,then which one of the following congruence conditions applies:
a) SAS
b) ASA
c) SSS
d) RHS

Q.20. In triangle ABC, if AB=BC and ∠B = 70, ∠A will be:
a) 70^0
b) 110^0
c) 55^0
d) 130^0

Q.21. All the medians of a triangle are equal in case of a:
a) Scalene triangle
b) Right angled triangle
c) Equilateral triangle
d) Isosceles triangle

Q.22. In triangles ABC and PQR, AB = AC, ∠C = ∠P and ∠B = ∠Q. The two triangles are:
a) Isosceles but not congruent
b) Isosceles and congruent
c) Congruent but not isosceles
d) Neither congruent nor isosceles

Q.23. In triangles ABC and DEF, AB = FD and ∠A = ∠D. The two triangles will be congruent by SAS axiom if:
a) BC = EF
b) AC = DE
c) AC = EF
d) BC = DE

Q.24. If in ΔPQR, RQ = PR then:
a) ∠P = ∠R
b) ∠P = ∠Q
c) ∠Q = ∠R
d) None of these

Q.25. In triangle PQR if ∠Q = 120°, then:
a) PQ is the longest side
b) QR is the longest side
c) PR is the longest side
d) None of these

Q.26. It is given that Δ ABC ≅ Δ FDE and AB = 5 cm, ∠B = 40° and ∠A = 80°. Then which of the following is true?
a) DF = 5 cm, ∠F = 60°
b) DF = 5 cm, ∠E = 60°
c) DE = 5 cm, ∠E = 60°
d) DE = 5 cm, ∠D = 40°

Q.27. In ΔPQR, if ∠P > ∠Q, then
a) QR > PR
b) PQ > PR
c) PQ < PR
d) QR < PR

Q.28. In triangle PQR if PQ=3cm,QR=4cm and PR=5cm then
a) ∠P>∠Q>∠R
b) ∠R>∠P>∠Q
c) ∠Q <∠P<∠R
d) ∠Q>∠P>∠R

Q.29. If E and F are the midpoints of equal sides AB and AC of a triangle ABC. Then:
a) BF=AC
b) BF=AF
c) CE=AB
d) BE=CF

Q.30. In triangles ABC the angles are in ration2:3:5 than angles of a triangle are:
a) 36°, 54°,90°
b) 50°, 30°,10°
c) 30°, 30°,90°
d) 45°, 45°,90°

Q.31. ΔABC is an isosceles triangle, AB=AC, ∠A=$120^0$and ∠ACD is an exterior angle then the value of ∠ACD is :
a) 120^0
b) 150^0
c) 140^0
d) 130^0

Q.32. ΔABC is an isosceles triangle in which altitude BE and CF are drawn to equal sides AC and AB respectively. Then:
a) BE>CF
b) BE<CF
c) BE=CF
d) None

Q.33. If Δ ABC ≅ Δ PQR, then which of the following is not true?

a) AC = PR
b) BC = PQ
c) QR = BC
d) AB = PQ

Q.34. Line segment joining the midpoint of any side with the opposite vertex is
a) altitude
b) median
c) perpendicular bisector
d) angle bisector

Q.35. The point of intersection of all the altitudes of a triangle is
a) orthocentre
b) incentre
c) circumcentre
d) centroid

Q.36. The point of intersection of all the medians of a triangle is
a) orthocentre
b) incentre
c) circumcentre
d) centroid

Q.37. The point of intersection of the angle bisector of all internal angles of a triangle is
a) incentre
b) orthocentre
c) circumcentre
d) centroid

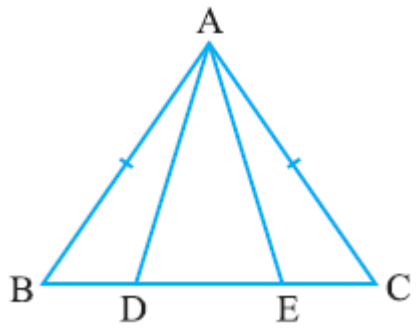
Q.38. In a triangle ABC, if $2\angle A = 3\angle B = 6\angle C$, then the measure of $\angle A$ is
a) 75^0
b) 30^0
c) 60^0
d) 90^0

Q.39. In a triangle ABC, if $\angle A - \angle B = 330$ and $\angle B - \angle C = 180$, then the measure of $\angle B$ is
a) 88^0
b) 37^0
c) 55^0
d) 60^0

Q.40. . In a triangle ABC, if $\angle A - \angle B = 330$ and $\angle B - \angle C = 180$, then the measure of $\angle C$ is
a) 60^0
b) 37^0
c) 55^0
d) 99^0

CASE STUDY QUESTION
CLASS :IX
CHAPTER :TRIANGLE

Q.1. Five students A,B,C,D and E are sitting in the open field as shown in the figure such that the distance between A to B and A to C is same. It is also observed that the distance between two students B to E and C to D are also equal on the basis of this information answer the following questions:
Answer any five



Q.(i).In ΔABC which two angles will be equal?
a) $\angle A$ and $\angle B$
b) $\angle C$ and $\angle B$
c) $\angle A$ and $\angle C$
d) $\angle A$ and $\angle D$

Q.(ii).What is the difference between BE and DE?
a) BD
b) DE
c) AB
d) AC

Q.(iii).What is the difference between CD and EC?
a) BD
b) DE
c) AC
d) EC

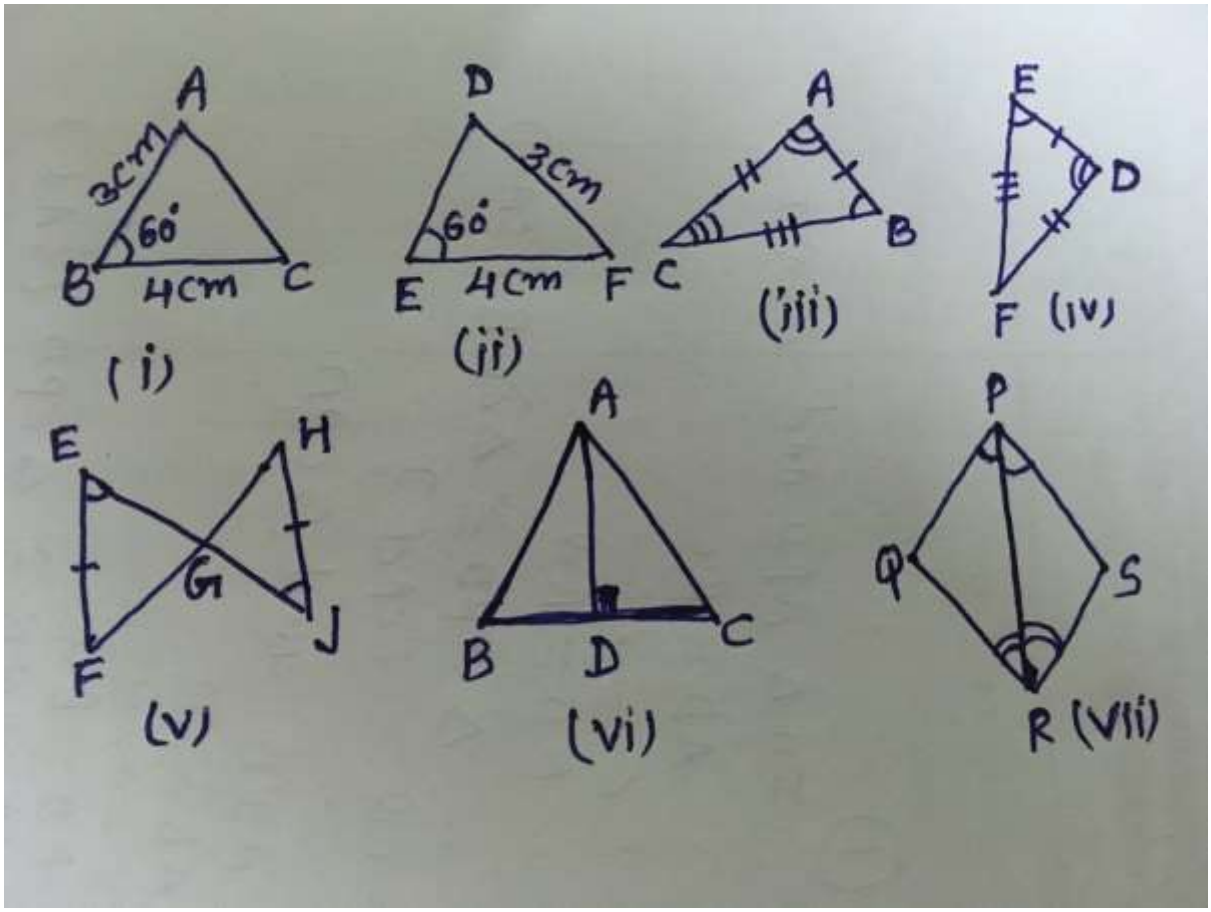
Q.(iv). What can you say about BD and EC?

a) Both are different
b) BD is larger
c) BD is smaller
d) BD=EC

Q.(v). By Which criteria we can say Δ ABD ≅ Δ ACE?
a) SAS
b) ASA
c) SSS
d) RHS

Q.(vi).What Can we say about the distance between A to D and A to E ?
a) AD > AE
b) AD<AE
c) AD =AE
d) None

Q.2.A teacher drawn the figure of many triangle on board and asked the questions about triangles to check their knowledge about the congruence of triangle. These are the figures of different triangles.
Answer any five



Q.(i).The triangles (i) and (ii) are congruent by which criteria?
a) SSS

b) SAS
c) AAS
d) Triangles are not congruent

Q.(ii). The triangles (iii) and (iv) are not congruent by which criteria?
a) RHS
b) SAS
c) AAS
d) SSS

Q.(iii). ΔEFG and ΔJHG are congruent by which criteria?
a) SSS
b) SAS
c) AAS
d) ASA

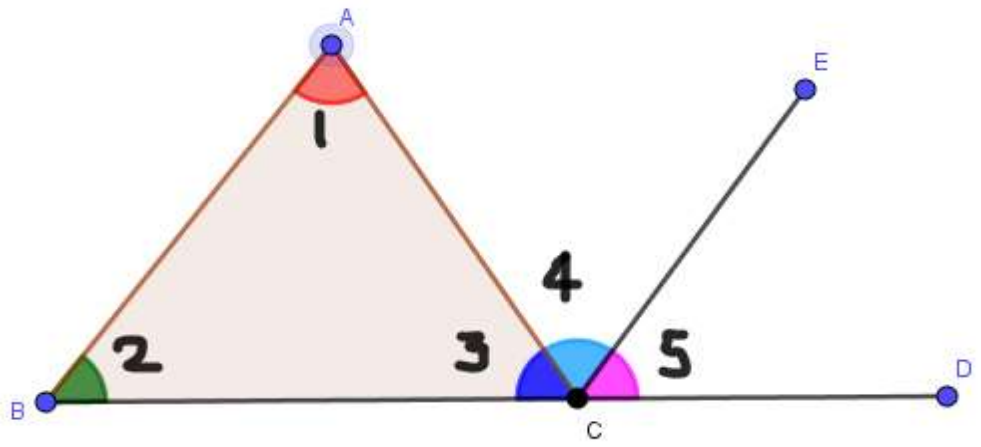
Q.(iv). In isosceles triangle ABC, in which AB=AC and AD is perpendicular on BC ΔADB and ΔADC are congruent by which criteria?
a) SSS
b) SAS
c) ASA
d) RHS

Q.(v). In the figure (Vii) ΔPQR and PSR are congruent by which criteria?
a) ASA
b) SAS
c) RHS
d) SSS

Q.(vi). Which of the following is not correct?
a) ΔABC≅ ΔDEF {Fig (iii) and (iv)}
b) ΔEFG≅ ΔJHG {Fig (v)}
c) ΔADB≅ ΔADC {Fig (vi)}
d) ΔPQR≅ ΔRSP {Fig (vii)}

Q.3.

Once the Maths teacher of class IX told students that today we will prove that the sum of all three angles is180^0.As shown in the figure. He told to draw any triangle ABC in the notebook Further side BC was extended to D.
Now the teacher said to draw CE ll BA. Further angles were named 1 to 5 as shown in the figure. Now answer the following questions. Answer any five



Q.(i).CE ll BA and AC is a transverse line.So $\angle 1$ is equal to

a) $\angle 2$
b) $\angle 3$
c) $\angle 4$
d) $\angle 5$

Q.(ii). $\angle 2$ is equal to Which equal ?
a) $\angle 2$
b) $\angle 3$
c) $\angle 4$
d) $\angle 5$

Q.(iii). What is the value of $\angle 3+\angle 4+\angle 5$?

a) 180^0
b) 120^0
c) 200^0
d)360^0

Q.(iv). What is the value of $\angle ACD=\angle 4+\angle 5$?
a) $\angle 3+\angle 5$
b) $\angle 1+\angle 2$
c) $\angle 2+\angle 3$
d) $\angle 3+\angle 4$

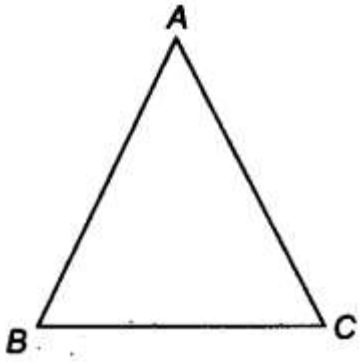
Q.(v). What is the value of $\angle 1+\angle 2+\angle 3$?
a) $\angle 3+\angle 4+\angle 5=180^0$
b) 360^0
c) $\angle 3+\angle 4=180^0$
d) $\angle 3+\angle 5=200^0$

Q.(vi). What will be angle $\angle ACD$?
a) $\angle 3+\angle 5$
b) $\angle 3+\angle 2$
c) $\angle 1+\angle 3$
d) $\angle 1+\angle 2$

TRIANGLE

GIST OF THE CHAPTER

- **Triangle:** A closed figure formed by three intersecting lines is called a triangle. A triangle has three sides, three angles and three vertices.



Triangle ABC, denoted as ΔABC.

AB, BC, CA are the three sides,

∠A, ∠B, ∠C are the three angles and

A, B, C are three vertices.

- **Congruence of Triangles:** Two triangles are congruent if the sides and angles of one triangle are equal to the corresponding sides and angles of the other triangle.
- If ∆PQR is congruent to ∆ABC, we write ∆PQR = ∆ABC.

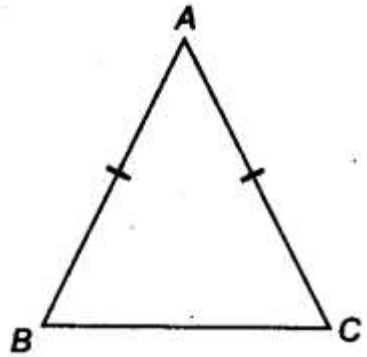
Note: Congruent triangles corresponding parts are equal and we write in short 'CPCT' for Corresponding Parts of Congruent Triangles.

- Criteria for Congruence of Triangles.

- **SAS congruence rule:** Two triangles are congruent if two sides and the included angle of one triangle are equal to the sides and the included angle of the other triangle.
- **ASA congruence rule:** Two triangles are congruent if two angles and the included sides of one triangle are equal to two angles and the included side of another triangle.
- **AAS congruence rule:** Two triangles are congruent if any two pairs of angles and one pair of corresponding sides are equal.
- **SSS congruence rule:** Two triangles are congruent if three sides of one triangle are equal to the sides of the other triangle.
- **RHS congruence rule:** If in two right triangles, hypotenuse and one side of a triangle are equal to the hypotenuse and one side of other triangles, then the two triangles are congruent.

- Properties of a Triangle

- **Isosceles triangle:** A triangle in which two sides are equal is called an isosceles triangle. So, ∆ABC is an isosceles triangle with AB = AC.



- **Theorem 1:** Angles opposite to equal sides of an isosceles triangle are equal. i.e., ∠B = ∠C
- **Theorem 2:** The sides opposite to equal angles of a triangle are equal. i.e., AB = AC

➢ Inequalities in a Triangle

- If two sides of a triangle are unequal, the angle opposite to the longer side is larger (or greater).
- In any triangle, the side opposite to the larger (or greater) angle is longer (converse of (i)).
- The sum of any two sides of a triangle is greater than the third side, i.e., AB + BC > CA.

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