

10 DAYS PROGRAM

MINIMUM LEVEL OF LEARNING

SESSION 2024-25

S. NO.	CHAPTER/TOPIC	MARKS COVERED AS PER LATEST CBSE SAMPLE PAPERS	DAY
1	Real Numbers	4	Day-1
2	Statistics	6	Day-2,3
3	Probability	3	Day-4
4	Triangles & circle Theorem and based questions	6	Day-5&6
5	AP	4	Day-7&8
6	Polynomial	3	Day 9
7	Coordinate geometry	4	Day10
Total Marks		30	

Day – 1

Concepts to be covered (Real Numbers)

Concept	Text Book problems
Fundamental Theorem of Arithmetic , HCF & LCM	Example -5,7,8 Ex:1.2 ,Q1,Q2,Q3,Q4,5
Irrational Numbers PROVE of irrationality	Example -9,10,11 Ex: 1.3 Q:1.2

Fundamental Theorem of Arithmetic, HCF & LCM by Prime Factorisation

1. Write all Prime numbers between 1 and 50.
2. Write prime Factorisation of (i) 156 (ii) 660 (iii) 816.
3. Find LCM and HCF of (I) 96 and 128 (ii) 33 and 121 (iii) 288 and 120
4. Find LCM and HCF of 26 and 91 and verify $\text{LCM}(a,b) \times \text{HCF}(a,b) = a \times b$.
5. Prove that 6^n does not end with zero, where n is a natural number
6. Given that $\text{LCM}(26, 169) = 338$, write $\text{HCF}(26, 169)$. Ans.13
7. Find the HCF and LCM of 6, 72 and 120 using the prime factorization method.
Ans. $\text{HCF} = 6$, $\text{LCM} = 360$
8. Prove that 4^n does not end with zero, where n is a natural number
9. Find the greatest number that will divide 445, 572 and 699 leaving remainders 4, 5 and 6 respectively.
Ans.63

Irrational Numbers: PROVE of irrationality

1. Show that $\sqrt{2}$ is an irrational number
2. Show that $\sqrt{3}$ is an irrational number
3. Show that $\sqrt{5}$ is an irrational number
4. Show that $3 - 5\sqrt{2}$ is an irrational number
5. Show that $7\sqrt{2}$ is an irrational number
6. Show that $3 + \sqrt{2}$ is an irrational number

Day – 2,3

Concepts to be covered (Statistics)

Mean of grouped data	
1. Direct Method	Example:2 Ex:14.1 Q:1&3
2. Assumed Mean Method	Ex:14.1 Q:6
Mode of grouped data	Example:5 Ex:14.2 Q:1,5
Median of grouped data	Example:7,8 Ex:14.3 Q1,3,5

Mean of grouped data

Q1 Find the mean by using assumed mean method

Class interval	10-20	20-30	30-40	40-50	50-60	60-70	Answer
Frequency	11	15	20	30	14	10	. 40.1

Q2.Find the mean by using assumed mean method

Class interval	5-14	15-24	25-34	35-44	45-54	55-64	Answer
Frequency	6	11	21	23	14	5	34.875

Q3. Compute the arithmetic mean

Marks obtained	Less than 10	Less than 20	Less than 30	Less than 40	Less than 50	Less than 60	Less than 70	Less than 80
Number of students	12	19	35	47	58	65	84	100
Ans. 43								

Q4 The mean of the following frequency distribution is 24. Find the value of P.

Marks	0-10	10-20	20-30	30-40	40-50	Answer
Number of students	15	20	35	P	10	20

Q5.The mean of the following frequency distribution is 57.6 and the total number of the observations is 50.Find f_1 and f_2

Class	0-20	20-40	40-60	60-80	80-100	100-120	$f_1 = 8, f_2 =$
Frequency	7	f_1	12	f_2	8	5	10

Q6.The following distribution shows the marks obtained by 60 students with two of the figures missing.If the mean mark is 26.5, find the missing figures?

Marks	0-10	10-20	20-30	30-40	40-50	50-60	
Number of students	4	16	?	10	?	3	20, 7

Mode of grouped data

Q1. Compute the mode from the following series.

Size	45-55	55-65	65-75	75-85	85-95	95-105	105-115	Ans.
Frequency	7	12	17	30	32	6	10	85.714

Q2. The mode of the following series is 36. Find the missing frequency in it.

Class interval	0-10	10-20	20-30	30-40	40-50	50-60	60-70	Ans.
Frequency	8	10	x	16	12	6	7	10

Median of grouped data

Q1. Find the median of the following frequency distribution

Marks	0-100	100-200	200-300	300-400	400-500	500-600	600-700	700-800	800-900
Frequency	2	5	9	12	17	20	15	9	7

Ans. 515

Q2. Find the median of the following frequency distribution

Height(in cm)	160-162	163-165	166-168	169-171	172-174	Ans. 167
Frequency	15	117	136	118	14	

Q3. The median of the following data is 525. Find the values of x and y, if the total frequency is 100.....Ans. x=9, y=15

Class interval	0-100	100-200	200-300	300-400	400-500	500-600	600-700	700-800	800-900	900-1000
Frequency	2	5	x	12	17	20	y	9	7	4

Q4. The median of the following data is 20.75. Find the missing frequencies x and y, if the total frequency is 100.

Class interval	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	x=17, y=20
Frequency	7	10	x	13	Y	10	14	9	

Day – 4

Concepts to be covered (Probability)

1. The probability of getting bad egg in a lot of 400 is 0.035. Then find the no. of bad eggs in the lot. [ans.14]
2. Write the probability of a sure event.
[ans.1]
3. What is the probability of an impossible event.
[ans.0]
4. When a dice is thrown, then find the probability of getting an odd number less than 3.
[ans. $\frac{1}{6}$]
5. A girl calculates that the probability of her winning the third prize in a lottery is 0.08. If 6000 tickets are sold, how many tickets has she bought.
[Ans.480]
6. What is probability that a non-leap year selected at random will contain 53 Sundays.
[Ans. $\frac{1}{7}$]
7. A bag contains 40 balls out of which some are red, some are blue and remaining are black. If the probability of drawing a red ball is $\frac{11}{20}$ and that of black ball is $\frac{1}{5}$, then what is the no. of black ball.
[Ans.10]
8. Two coins are tossed simultaneously. Find the probability of getting exactly one head.
[Ans. $\frac{1}{2}$]
9. A card is drawn from a well shuffled deck of 52 cards. Find the probability of getting an ace.
[Ans. $\frac{1}{13}$]
10. In a lottery, there are 10 prizes and 25 blanks. Find the probability of getting a prize.
[Ans. $\frac{2}{7}$]
11. Find the probability that a no. selected at random from the number 3,4,5,6,.....25 is prime. [Ans. $\frac{8}{23}$]
12. A bag contains 5 red, 4 blue and 3 green balls. A ball is taken out of the bag at random. Find the probability that the selected ball is (a) of red colour (b) not of green colour.
[Ans. $\frac{5}{12}, \frac{3}{4}$]
13. A card is drawn at random from a well-shuffled deck of playing cards. Find the probability of drawing
(a) A face card (b) card which is neither a king nor a red card [Ans. $\frac{3}{13}, \frac{6}{13}$]
14. A dice is thrown once. What is the probability of getting a number greater than 4?
[Ans. $\frac{1}{3}$]
15. Two dice are thrown at the same time. Find the probability that the sum of two numbers appearing on the top of the dice is more than 9.
[Ans. $\frac{1}{6}$]
16. Two dice are thrown at the same time. Find the probability of getting different numbers on both dice. [Ans. $\frac{5}{6}$]
17. A coin is tossed two times. Find the probability of getting almost one head. [Ans. $\frac{3}{4}$]

18. Cards with numbers 2 to 101 are placed in a box. A card selected at random from the box. Find the probability that the card which is selected has a number which is a perfect square.
[Ans. $\frac{9}{100}$]

19. Find the probability of getting the letter M in the word "MATHEMATICS". [Ans. $\frac{2}{11}$]

20. Cards bearing numbers 3, 5, ..., 35 are kept in a bag. A card is drawn at random from the bag. Find the probability of getting a card bearing (a) a prime number less than 15 (b) a number divisible by 3 and 5.

[Ans. $\frac{5}{17}, \frac{2}{17}$]

21. Two dice are thrown at the same time. Find the probability of getting (a) same no. on the both side (b) different no. on both dices.

[Ans. $\frac{1}{6}, \frac{5}{6}$]

22. A child game has 8 triangles of which three are blue and rest are red and ten squares of which six are blue and rest are red. One piece is lost at random. Find the probability of that is (a) A square (b) A triangle of red colour.

[Ans. $\frac{5}{9}, \frac{5}{18}$]

23. Two dice are thrown simultaneously. What is the probability that:

(a) 5 will not come up either of them? (b) 5 will come up on at least one? (c) 5 will come at both dice?

[Ans. $\frac{25}{36}, \frac{11}{36}, \frac{1}{36}$]

24. The king, queen and jack of clubs are removed from a deck of 52 playing cards and remaining cards are shuffled. A card is drawn from the remaining cards. Find the probability of getting a card of (a) heart (b) queen (c) clubs

[Ans. $\frac{13}{49}, \frac{3}{49}, \frac{10}{49}$]

25. A game consist of tossing a one-rupee coin 3 times and noting its outcome each time. Hanif wins if all the tosses give the same result, i.e., 3 heads or three tails and loses otherwise. Calculate the probability that Hanif will lose the game.

[Ans. $\frac{3}{4}$]

Day – 5

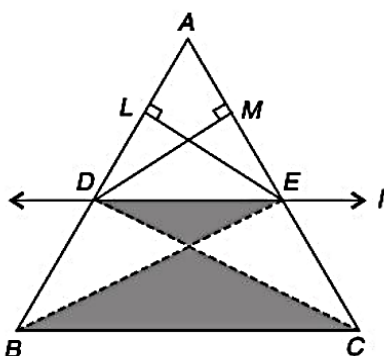
Concepts to be covered (Triangles)

IMPORTANT THEOREMS

BASIC PROPORTIONALITY THEOREM OR THALES THEOREM

If a straight line is drawn parallel to one side of a triangle intersecting the other two sides, then it divides the two sides in the same ratio

GIVEN: A ΔABC and line 'l' parallel to BC intersect AB at D and AC at E.



TO PROVE :

$$\frac{AD}{DB} = \frac{AE}{EC}$$

CONSTRUCTION : Join BE and CD. Draw $EL \perp$ to AB and $DM \perp$ AC.

PROOF: We know that areas of the triangles on the same base and between same parallel lines are equal, hence we have :

$$\text{area } (\Delta BDE) = \text{area } (\Delta CDE) \quad \dots(i)$$

Now, we have

$$\frac{\text{Area of } \Delta ADE}{\text{Area of } \Delta BDE} = \frac{\frac{1}{2} \times AD \times EL}{\frac{1}{2} \times DB \times EL} = \frac{AD}{DB} \quad \dots(ii)$$

Again, we have

$$\frac{\text{Area of } \Delta ADE}{\text{Area of } \Delta CDE} = \frac{\frac{1}{2} \times AE \times DM}{\frac{1}{2} \times EC \times DM} = \frac{AE}{EC} \quad \dots(iii)$$

Put value from (i) in (ii), we have

$$\frac{\text{Area of } \Delta ADE}{\text{Area of } \Delta CDE} = \frac{AD}{DB} \quad \dots(iv)$$

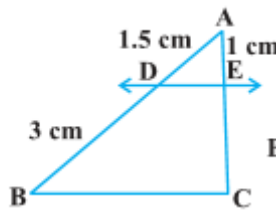
On comparing equation (ii) and (iii), we get

$$\frac{AD}{DB} = \frac{AE}{EC}$$

Hence Proved.

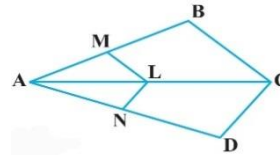
Q.1: In the given figure, $DE \parallel BC$. Find EC.

(1)



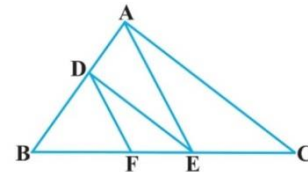
Q2. In Fig if $LM \parallel CB$ and $LN \parallel CD$, prove that

$$\frac{AM}{AB} = \frac{AN}{AD}$$



Q3. In fig $DE \parallel AC$ and $DF \parallel AE$. Prove that

$$\frac{BF}{FE} = \frac{BE}{EC}$$



Q4. Prove that the line segment joining the mid points of any two sides of a triangle is parallel to the third side.

Q5. Prove that a line drawn through the mid point of one side of a triangle parallel to another side bisects the third side

Day – 6

Concepts to be covered (Circles)

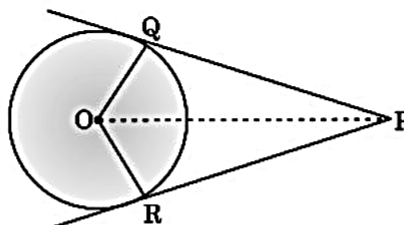
Tangents to a circle	Q3(Ex10.1) Q 1, Q6, Q7(Ex 10.2), 4
Number of tangents from a point to a circle	Theorem 10.1, 10.2 Eg 2.1 Q8, 9, 10, 12, 13(Ex 10.2)

THEOREMS

The tangent to a circle is perpendicular to the radius through the point of contact.
The lengths of tangents drawn from an external point to a circle are equal.

Given : A circle $C(O, r)$ and two tangents say PQ and PR from an external point P .

To prove : $PQ = PR$.



Construction : Join OQ , OR and OP .

Proof : In $\triangle OQP$ and $\triangle ORP$

$$OQ = OR$$

(radii of the same circle)

$$OP = OP$$

(Common)

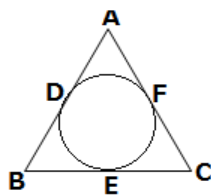
$\angle Q = \angle R = \text{each } 90^\circ$ (The tangent at any point of a circle is perpendicular to the radius through the point of contact)

Hence $\triangle OQP \cong \triangle ORP$

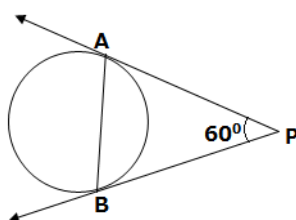
(By RHS Criterion)

Hence Proved.

Q1. In the given figure, $AB = AC$, then prove that $BE = EC$

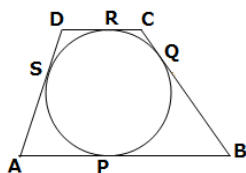


Q2. In the given figure, PA and PB are tangents such that $PA = 9$ cm and $\angle APB = 60^\circ$. Find the length of the chord AB.
Ans. 9 cm



Q3. If all the sides of a parallelogram touch a circle. Show that the parallelogram is a rhombus

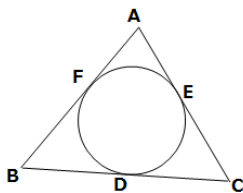
Q4. In the given figure, a circle touches all the four sides of a quadrilateral ABCD whose sides are $AB = 6$ cm, $BC = 7$ cm and $CD = 4$ cm. Find AD
Ans. 3 cm



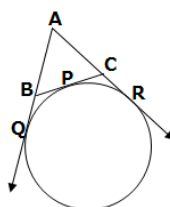
Q5. ABC is a right angled triangle with $AB = 6$ cm, $AC = 8$ cm and $\angle A = 90^\circ$. A circle with centre O has been inscribed inside the triangle. Find the radius of the inscribed circle.
Ans. 2 cm

Q6. A point P is 26 cm away from the centre of a circle and the length of the tangent drawn from P to the circle is 24 cm. Find the radius of the circle.
Ans. 10 cm

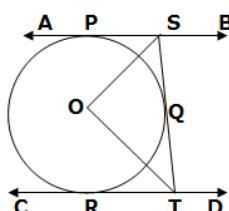
Q7. In the given figure, the incircle of $\triangle ABC$ touches the sides BC, CA and AB at D, E, F respectively. Prove that $AF + BD + CE = AE + BF + CD = \frac{1}{2}$ Perimeter of $\triangle ABC$



Q8. A circle touches the sides BC of a $\triangle ABC$ at P, and touches AB and AC produced at Q and R respectively, as shown in the figure. Show that $AQ = \frac{1}{2}$ Perimeter of $\triangle ABC$



Q9 In the given figure, AB and CD are two parallel tangents to a circle with centre O and ST is the tangent segment between the above parallel tangents touching the circle at Q. Show that $\angle SOT = 90^\circ$



Day – 7&8

Concepts to be covered (Arithmetic Progression)

General form of an A.P.	Exp-1,2, Ex. 5.1 Q.s2(a), 3(a),4(v)
n^{th} term of an A.P.	Exp. 3,7,8 Ex. 5.2 Q.4,7,11,16,17,18
Sum of first n terms of an A.P.	Exp.11,13,15 Ex. 5.3, Q.No.1(i, ii) Q3(i,iii) Q.7,10,12,11,6, Ex5.4, Q-1

General form of an A.P. & n^{th} term of an A.P.

- Find n^{th} term of $-15, -18, -21, \dots$ Ans .-3 (n+4)
- Find the A.P whose first term is 4 and common difference is -3 Ans .AP = 4 , 1 -2, -5
- Find 5^{th} term from end of the AP : 17 , 14 ,11.....-40. Ans . -28
- If $2p, p+10, 3p+2$ are in AP then find p. Ans . p= 6
- Which term of the A.P. 12,7,2,-3,... is -98? Ans . 23.
- Find n^{th} term of an AP is $7-4n$. Find its common difference. Ans. -4.
- Which term of an AP 5,2,-1,...will be -22 ? Ans . 10^{th} term .
- Write the next term of an AP $\sqrt{8}, \sqrt{18}, \sqrt{32}, \dots$ Ans. $5\sqrt{2}$.
- Determine 27^{th} term of an AP whose 9^{th} term is -10 and common difference is $1\frac{1}{4}$ Ans. $\frac{25}{2}$.
- Which term of the AP 3, 15, 27,39,...will be 132 more than its 54^{th} term ?Ans. 65^{th} term .
- Show that the sequence defined by $t_n = 4n + 7$ is an AP.
- Find the number of terms for given AP :7,13 ,19,25,...,205.
- The 7^{th} term of an AP is 32 and it 13^{th} term is 62. Find AP.

Sum of first n terms of an A.P.

1. If arithmetic mean between $3a$ and $2a-7$ is $a+4$, then find a . Ans. $a=5$
2. Find sum of all odd integer between 300 & 498. Ans. 39501
3. Evaluate $4+3+8+5+12+7+\dots$ to 32 terms. Ans. 832
4. If sum of n terms of an AP is $2n^2+5n$, then find its n^{th} term. Ans. $4n+3$.
5. Find the sum of series $103+101+99+\dots+49$. Ans. 2128.
6. Find the sum of even numbers from 200 to 500. Ans. 51250.
7. Find the sum of first 18 terms of an A.P. whose n^{th} term is $3-2n$. Ans. -288
8. If the n^{th} term of an AP is $(2n+1)$, find the sum of first n terms of the AP.
Ans. $S_n=n(n+2)$
9. Find the sum of all natural numbers between 250 and 1000 which are exactly divisible by 3. Ans. 156375.
10. Find the sum of all two digit odd positive nos.
11. Find the value of 'x' for AP. $1+6+11+16+\dots+X=148$.
12. The sum of three numbers of AP is 3 and their product is -35. Find the numbers.

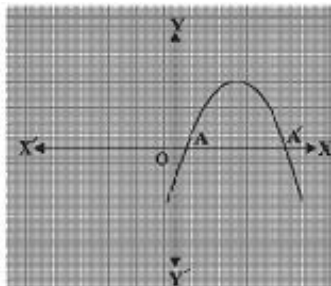
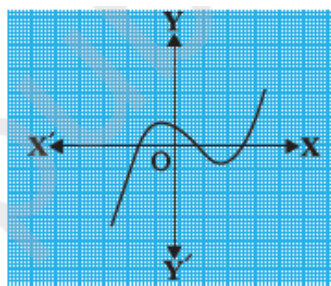
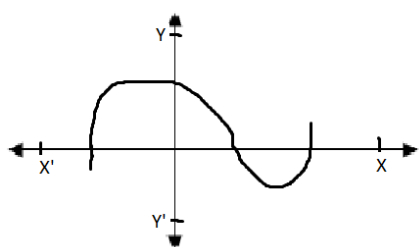
Day – 9

Concepts to be covered (Polynomial)

Meaning of the zero of Polynomial	Ex -2.1 Q:1
Relationship between zeroes and coefficients of a polynomial	Example -2,3Ex-2.2Q:1
Forming a quadratic polynomial	Ex -2.2 Q:2

Meaning of the zero of Polynomial

In a graph of $y=p(x)$ find the number of zeroes in the following graphs.



Relationship between zeroes and coefficients of a polynomial

If α, β are zeroes of $P(x) = ax^2 + bx + c$ then :

1. Sum of zeroes $= \alpha + \beta = \frac{-b}{a} = \frac{\text{-Coefficient of } x}{\text{coefficient of } x^2}$
2. Product of zeroes $= \alpha \cdot \beta = \frac{c}{a} = \frac{\text{Constant term}}{\text{coefficient of } x^2}$

Q1. Find the zeros of the following quadratic polynomials and verify the relationship between the zeros and the coefficients

- (i) $2y^2-8y+6$ (ii) $8x^2+2x-15$ (iii) x^2-6 (iv) $5x^2+10x$

Forming a quadratic polynomial

Q2. A quadratic polynomial whose zeroes are α and β , is given by:

$$p(x) = x^2 - (\alpha + \beta)x + \alpha\beta = x^2 - (\text{sum of zeroes})x + \text{product of zeroes}.$$

Q3. Find a quadratic polynomial each with the given numbers as the sum and product of its zeros respectively: (i)-3,2 (ii) $0, -\frac{3}{2}$ (iii) $\frac{1}{4}, -1$ (iv) $\sqrt{2}, \frac{1}{3}$

Q4. Find a quadratic polynomial whose zeros are 2 and -6

$$\text{Ans. } x^2 + 4x - 12$$

Q5. Find a quadratic polynomial whose zeros are $\frac{2}{3}$ and $-\frac{1}{4}$

$$\text{Ans. } 12x^2 - 5x - 2$$

Q6. If α and β are the zeros of polynomial $2x^2 + x - 7$, find the value of $\alpha^2 + \beta^2$

$$\text{Ans. } \frac{29}{4}$$

Q7. If α and β are the zeros of polynomial $3x^2 + 5x - 7$, find the value of $\frac{1}{\alpha} + \frac{1}{\beta}$

$$\text{Ans. } \frac{5}{7}$$

Q8. Form a quadratic polynomial whose zeros are $3 \pm 2\sqrt{5}$

$$\text{Ans. } x^2 - 6x - 11$$

Day – 10

Concepts to be covered (Coordinate Geometry)

Distance Formula	Exercise 7.1, Q.No 1,2,3,4,7,8
Section Formula	Example No. 6,7,9
Mid Point Formula	Exercise 7.2, Q.No. 1,2,4,5
	Example 10. Ex.7.2, 6,8,9. Q.No.7

Distance Formula

- If the distance between the points (4,p)&(1,0) is 5, then find the value of p. Ans. ± 4
- Show that the point P (-4, 2) lies on the line segment joining the points A (-4, 6) and B(-4, -6).
- Show that the points (3, 2), (0, 5), (-3,2) and (0, -1) are the vertices of a square.
- Find the value of x for which the distance between the points P (4, -5) and Q(12, x) is 10 units. Ans. 1, -11
- What is the distance between the point A (c, 0) and B (0, -c)? Ans. $\sqrt{2}c$
- Find the distance between the points (a+b, a-b) and (a-b, a+b). Ans. $2\sqrt{2}b$
- Find the distance of the point (36, 15) from the origin. Ans. 39
- Find the value of k, if the points P(0,2) is equidistant from (3,k) and (k, 5). Ans. k=1
- Find the values of y for which the distance between the points P(2,-3) and Q(10,y) is 10 units. Ans. -9, 3
- Find a relation between x and y such that the point (x, y) is equidistant from the point (3,6) and (-3,4). Ans. $3x + y = 5$

11. Find all possible values of “a” for which the distance between the points (a, -1) and (5, 3) is 5 unit. Ans. a=8 or 2

12. Find the ordinate of a point whose abscissa is 10 and which is at a distance of 10 units from (2, -3) Ans. (3, - 9)

Section Formula

1. If the coordinates of the points P and Q are (4,-3) and (-1,7). Then find the abscissa of a point R on the line segment PQ such that $\frac{PR}{PQ} = \frac{3}{5}$ Ans.1

2. Find the ratio in which the y-axis divides the segment joining (-3,6) and (12,-3). Ans.1/4

3. Find the coordinates of a point A, where AB is diameter of a circle whose centre is (2, -3) and B is (1, 4) Ans. (3, -10)

4. Find the centroid of triangle whose vertices are (3, -7), (-8, 6) and (5, 10). Ans. (0, 3)

5. Point P divides the line segment joining the points A(2,1) and B(5,-8) such that AP:AB=1:3.If P lies on the line $2x-y+k=0$, then find the value of k. Ans. k = -8

6. Find the ratio in which the line $2x+3y=10$ divides the line segment joining the points (1,2) and (2,3). Ans.2:3

7. In what ratio does the point (2, 5) divide the join of (8, 2) and (-6, 9)? Ans.3:4

8. In what ratio is the line joining (2,-3) and (5, 6) divided by the X axis? Find the coordinates of the point of division. Ans.1:2, (3, 0)

9. In what ratio is the line joining (-5, 9) and (7,-3) divided by the Y- axis ? Find the coordinates of the point of division. Ans.5:7, (0, 4)

Mid Point Formula

1.If P ($\frac{a}{3}$,4) is the midpoint of the line segment joining the points Q (-6 , 5) and R (-2 , 3) , then find the value of a . Ans . -12

2. If the points A (4,3) and B (x,5) are on the circle with centre O(2,3) then find the value of x. Ans. 2

3. A line intersects y –axis and x-axis at the points P and Q respectively . If (2 ,-5) is the midpoint of PQ , then find the coordinates of P and Q respectively . Ans. (0,-10) and (4,0)

4. If A (-2, 4) ,B (0, 0) , C (4, 2) are the vertices of a ΔABC , then find the length of median through the vertex A. Ans. 5 units

