CHAPTER - 5 - COORDINATE GEOMETRY

I. Answer the Following (2 marks)

1. Show that the points $P(-1.5, 3)$, $Q(6,-2)$, $R(-3, 4)$ are collinear.
2. Find the area of the triangle formed by the points (–10, –4), (–8, –1) and (–3, –5).
3. The line r passes through the points (–2, 2) and (5, 8) and the line s passes through the points (–8, 7) and (–2, 0). Is the line r perpendicular to s?
4. What is the inclination of a line whose slope is (i) 0 (ii) 1
5. Find the slope of a line joining the points $(\sin\theta, -\cos\theta)$ and $(-\sin\theta, \cos\theta)$.
6. Find the equation of a line which passes through (5,7) and makes intercepts on the axes equal in magnitude but opposite in sign.
7. Find the intercepts made by the line $4x - 9y + 36 = 0$ on the coordinate axes.
8. Find the slope and y intercept of $\sqrt{3}x + (1-\sqrt{3})y = 3$.
9. Find the equation of a straight line which has slope $\frac{-5}{4}$ and passing through the point (–1,2).
10. Find the equation of a line whose intercepts on the x and y axes are given below.

    (I) 4, –6 (II) $-5, \frac{3}{4}$
11. Show that the straight lines $2x + 3y - 8 = 0$ and $4x + 6y + 18 = 0$ are parallel.
12. Show that the straight lines $x - 2y + 3 = 0$ and $6x + 3y + 8 = 0$ are perpendicular.
13. Find the equation of a straight line perpendicular to the line $y = \frac{4}{3}x - 7$ and passing through the point (7, –1).
14. Find the slope of the following straight lines (I) $5y - 3 = 0$ (II) $7x - \frac{3}{17} = 0$

II. Answer the Following (3 marks)

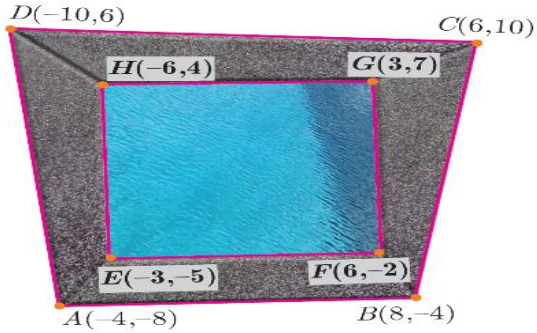
1. Find the area of the triangle whose vertices are (-3,5) , (5,6) and (5,-2)
2. Determine whether the sets of points are collinear $(a, b+c)$, $(b, c+a)$ and $(c, a+b)$.
3. Show that the points (-2,5) , (6,-1) and (2,2) are collinear.
4. What is the slope of a line perpendicular to the line joining $A(5,1)$ and P where P is the mid-point of the segment joining (4,2) and (-6, 4) .
5. If the three points (3,-1) , $(a, 3)$ and (1,-3) are collinear, find the value of a.
6. The line through the points $(-2,a)$ and (9, 3) has slope $-\frac{1}{2}$. Find the value of a.
7. The line through the points (-2,6) and (4,8) is perpendicular to the line through the points (8,12) and $(x,24)$. Find the value of x.
8. Let $A(3,-4)$, $B(9,-4)$, $C(5,-7)$ and $D(7,-7)$. Show that $ABCD$ is a trapezium.
9. A line makes positive intercepts on coordinate axes whose sum is 7 and it passes through (-3, 8). Find its equation.
10. Find the equation of a line whose inclination is 30˚ and making an intercept -3 on the *Y-axis*.
11. Find the value of 'a', if the line through (–2,3) and (8,5) is perpendicular to $y = ax + 2$
12. Find the equation of a line through the given pair of points (2, 3) and (-7,-1).
13. A cat is located at the point(-6,-4) in xy plane. A bottle of milk is kept at (5, 11). The cat wish to consume the milk travelling through shortest possible distance. Find the equation of the path it needs to take its milk.
14. Find the intercepts made by the following lines on the coordinate axes.

    (I) $3x - 2y - 6 = 0$ (II) $4x + 3y + 12 = 0$

15. If the straight lines $12y = -(p + 3)x + 12$, $12x - 7y = 16$ are perpendicular then find 'p'.
16. Find the equation of the perpendicular bisector of the line joining the points $A(-4,2)$ and $B(6,-4)$.
17. Find the equation of a straight line through the intersection of lines $7x + 3y = 10$, $5x - 4y = 1$ and parallel to the line $13x + 5y + 12 = 0$.

III. <u>Answer the Following (5 marks)</u>

1. Find the area of the quadrilateral formed by the points (8,6) , (5,11), (-5,12) and (-4, 3).
2. Find the area of the quadrilateral whose vertices are at (–9, –2), (–8, –4), (2, 2) and (1, –3).
3. Find the value of k, if the area of a quadrilateral is 28 sq.units, whose vertices are (–4, –2), (–3, k), (3, –2) and (2, 3).
4. Let $P(11,7)$, $Q(13.5, 4)$ and $R(9.5, 4)$ be the midpoints of the sides AB, BC and AC respectively of ΔABC . Find the coordinates of the vertices A, B and C. Hence, find the area of ΔABC and compare this with area of ΔPQR.
5. In the figure, the quadrilateral swimming pool shown is surrounded by concrete patio. Find the area of the patio.



6. A triangular shaped glass with vertices at $A(-5,-4)$, $B(1,6)$ and $C(7,-4)$ has to be painted. If one bucket of paint covers 6 square feet, how many buckets of paint will be required to paint the whole glass, if only one coat of paint is applied.
7. Show that the given points form a parallelogram :
   $A(2.5, 3.5)$, $B(10,-4)$, $C(2.5,-2.5)$ and $D(-5,5)$
8. If the points $A(2,2)$, $B(-2, -3)$, $C(1, -3)$ and $D(x, y)$ form a parallelogram then find the value of x and y.
9. A quadrilateral has vertices at $A(-4,-2)$, $B(5,-1)$, $C(6,5)$ and $D(-7,6)$. Show that the mid-points of its sides form a parallelogram.
10. Find the equation of the median and altitude of ΔABC through A where the vertices are $A(6,2)$, $B(-5,-1)$ and $C(1,9)$.
11. $A(-3, 0)$ $B(10,-2)$ and $C(12, 3)$ are the vertices of ΔABC . Find the equation of the altitude through A and B.
12. Find the equation of a straight line joining the point of intersection of $3x + y + 2 = 0$ and $x - 2y - 4 = 0$ to the point of intersection of $7x - 3y = -12$ and $2y = x + 3$.
13. Find the equation of a straight line through the point of intersection of the lines $8x + 3y = 18$, $4x + 5y = 9$ and bisecting the line segment joining the points (5,–4) and (–7,6).