

1. Find the ratio in which the line  $x - y - 2 = 0$  divides the line segment joining the points  $(3, -1)$  and  $(8, 9)$ . Find the coordinates of this point.
2. A quadrilateral has the vertices at the points  $(-4, 2)$ ,  $(2, 6)$ ,  $(8, 5)$  and  $(9, -7)$ . Show that the mid points of the sides of the quadrilateral are the vertices of a parallelogram.
3. The points A  $(0, 0)$ , B  $(1, 7)$ , C  $(5, 1)$  are the vertices of a triangle. Find the length of perpendicular from A to BC and hence the area of triangle ABC.
4. Find the equations of the sides of the triangle whose vertices are  $(-1, 8)$ ,  $(4, -2)$  and  $(-5, -3)$ .
5. Find the equations of the straight lines, which passes through the point  $(3, 4)$  and have intercepts on the axes such that their sum is 14.
6. Find point of intersection of the median of a triangle whose vertices are  $(-1, 0)$ ,  $(5, -2)$  and  $(8, 2)$ .
7. Find coordinates of the orthocenter of the triangle whose angular points are  $(1, 2)$ ,  $(2, 3)$  and  $(4, 3)$ .
8. Find coordinates of circumcentre of the triangle whose angular points are  $(4, -3)$ ,  $(-2, 1)$  and  $(2, 3)$ .
9. Show that the medians of the triangle with vertices  $(-1, 1)$ ,  $(3, 10)$  and  $(4, 2)$  are concurrent.
10. Show that the perpendicular bisectors of the sides of the triangle with vertices  $(-3, 2)$ ,  $(-1, 7)$  and  $(4, 3)$  are concurrent.
11. Show that the altitudes of the triangle with vertices  $(-4, -3)$ ,  $(1, 10)$  and  $(5, 5)$  are concurrent.
12. Find the angles between the lines  $x + 2y = 3$  and  $2x - 3y = 4$ .
13. Find the angles of a triangle whose sides are  $x + 2y - 8 = 0$ ;  $3x + y - 1 = 0$  and  $x - 3y + 7 = 0$ .
14. For what value of k, lines  $3x + y - 2 = 0$ ;  $kx + 2y - 3 = 0$  and  $2x - y - 3 = 0$  are concurrent?
15. Prove that line  $5x - 2y - 1 = 0$  is mid parallel to the lines  $5x - 2y - 9 = 0$  and  $5x - 2y + 7 = 0$ .
16. Find the image of the point  $(1, 2)$  in the line  $x - 3y + 4 = 0$ .
17. Find the image of the point  $(4, -3)$  in the line  $x + y + 1 = 0$ .
18. Find the distance of the line  $4x + 7y + 5 = 0$  from the point  $(1, 2)$  along the line  $2x - y = 0$ .
19. Find the equation of the line passing through the intersection of the lines  $x - 3y + 1 = 0$  and  $2x + 5y - 9 = 0$  and whose distance from the origin is 5 units.
20. Find the equations of straight lines which are perpendicular to the line  $3x + 4y - 7 = 0$  and are at a distance of 3 units from  $(2, 3)$ .

## ANSWERS

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|---|---------------------------------------|---|
| 1. 2:3; $(5, 3)$                            | 3. $17/\sqrt{13}$ units, 17 sq. units | 4. $2x + y - 6 = 0$ ; $x - 9y - 22 = 0$ ; $11x - 4y + 43 = 0$ |
| 5. $x + y = 7$ ; $4x + 3y = 24$             | 6. $(4, 0)$                           | 7. $(1, 6)$   |
| 12. $\tan^{-1}(7/4)$                        | 13. $45^\circ, 45^\circ, 90^\circ$    | 8. $(9/7, -4/7)$  |
| 17. $(2, -5)$                               | 18. $23\sqrt{5}/18$ units             | 14. $k = 5$   |
| 20. $4x - 3y + 16 = 0$ , $4x - 3y - 14 = 0$ |                                       | 16. $(6/5, 7/5)$  |
|   |                                       | 19. $2x + y - 5 = 0$  |