



## MATHEMATICS CLASS XI CHAPTER – 10 STRAIGHT LINES

- Q.1. Find the slope and inclination of line through pair of points (1, 2) and (5, 6).
- Q.2. Find the slope of a line perpendicular to the line, which passes through (0, 8) and (-5, 2).
- Q.3. What is the value of y, so that the line through (3, y) and (2, 7) is parallel to the line through (-1, 4) and (0, 6)?
- Q.4. Without using Pythagoras theorem, show that (12, 8), (-2, 6) and (6, 0) are the vertices of right angled triangle.
- Q.5. Write the equation of a line, parallel to X-axis and 5 units below it.
- Q.6. Find the equation of a line which is parallel to Y-axis and passes through (-4, 3).
- Q.7. Find a point on the X-axis which is equidistant from the points (7, 6) and (3, 4).
- Q.8. Find the equation of line joining the points (1, 1) and (2, 3).
- Q.9. Find the slope of a line, which passes through the origin and mid-point of the line segment joining the points P(0, -4) and B(8, 0).
- Q.10. Determine the X – intercept a and the Y – intercept b of the following lines
- (i)  $3x + 5y - 15 = 0$                       (ii)  $x - y - 7 = 0$



- Q.11. Find the equation of straight line which passes through the point (5,6) and has intercepts on the axes equal in magnitude but opposite in sign.
- Q.12. Find the slope of a line, which makes an angle of  $30^\circ$  with the positive direction of Y – axis measured anti-clockwise.
- Q.13. Without using distance formula, show that the points (-2,-1), (4,0), (3,3) and (-3,2) are the vertices of a parallelogram.
- Q.14. The slope of a line is double the slope of another line. If tangent of the angle between them is  $\frac{1}{3}$ , then find the slope of the lines.
- Q.15. Find the equation of the line for which  $p = 2 \sin \alpha = \frac{4}{5}$ .
- Q.16. Intersecting the Y-axis at a distance of 2 units above the origin and making an angle of  $30^\circ$  with positive direction of X – axis.
- Q.17. Perpendicular distance from the origin is 5 units and the angle made by the perpendicular with the positive X – axis is  $30^\circ$ .
- Q.18. Reduce the equation  $\sqrt{3}x + y = 4$  into normal form and hence find the values of p and  $\alpha$ .
- Q.19. Find the distance of the point (3, - 1) from the line  $12x - 5y - 7 = 0$ .
- Q.20. The perpendicular from the origin to a line meets it at the point (-2,9). Find the equation of the line.
- Q.21. A straight line moves so that the sum of the reciprocals of its intercepts made on axes is constant. Show that the line passes through a fixed point.
- Q.22. Determine the  $\angle B$  of the triangle with vertices A(-2,1), B(2,3) and C(-2,-4).



Q.23. Find the angle between the straight lines, whose equations are  $3x + y - 7 = 0$  and  $x + 2y + 9 = 0$ .

Q.24. Find the equation of the line perpendicular to the line  $x - 7y + 5 = 0$  and having X – intercept 3.

Q.25. Find the equation of the line passing through the point (5,2) and perpendicular to the line joining the points (2,3) and (3,-1).

Q.26. Find the equation of the line passing through the point of intersection of  $2x + y = 5$  and  $x + 3y + 8 = 0$  and parallel to the line  $3x + 4y = 7$ .

Q.27. Find the equation of the straight line passing through the point (3,2) and perpendicular to the line  $y = x$ .

Q.28. Find the new coordinates of point (-1, -2), if the origin is shifted to (-3, -2) by a translation.

Q.29. Find the transformed equation of  $xy - y^2 - x + y = 0$ , when the origin is shifted to the point (1,1) after translation of axes.

Q.30. Show that the straight lines given by  $x(a + 2b) + y(a + 3b) = a + b$  for different values of a and b pass through a fixed point.

Q.31. 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 this quadrilateral are the vertices of a parallelogram.

Q.32. Find the coordinates of the foot of perpendicular from the point (-1,3) to the line  $3x - 4y - 16 = 0$ .



Q.33. Show that the points  $(at_1^2, 2at_1)$ ,  $(at_2^2, 2at_2)$  and  $(a, 0)$  are collinear, if  $t_1t_2 = -1$ .

Q.34. Find the equations of two straight lines which are at a distance  $\frac{1}{2}$  from the origin and passes through the point  $(0,1)$ .

Q.35. Show that the points  $(1,4)$  and  $(0,-3)$  lies on the opposite sides of the line  $x + 3y + 7 = 0$ .

Q.36. Find the points on the Y – axis, whose perpendicular distance from the line  $4x - 3y - 12 = 0$  is 3.

Q.37. Prove that the following lines are concurrent  $5x - 3y = 1$ ,  $2x + 3y = 23$  and  $42x + 21y = 257$ .

Q.38. Find the equation of straight line which passes through  $(3,4)$  and the sum of whose intercepts on the coordination axes is 14.

Q.39. A line forms a triangle in the first quadrant with the coordinate axes. If the area of the triangle is  $54\sqrt{3}$  sq units and perpendicular drawn from the origin to the line makes an angle  $60^\circ$  with X – axis, then find the equation of the line.

Q.40. Which of the lines  $2x - y + 3 = 0$  and  $x - 4y - 7 = 0$ , is farther from the origin ?

Q.41. Show that the line  $3x + 3y + k = 0$ , passes through the point of intersection of  $3x + 4y + 6 = 0$  and  $6x + 5y - 9 = 0$ , if  $k = -1$

Q.42. The hypotenuse of a right angled triangle has its ends at the points  $(1,3)$  and  $(-4,1)$ . Find the equation of the legs (perpendicular sides) of the triangle.



Q.43. A ray of light passing through the point (1,2) reflects on the X – axis at point A and the reflected ray passes through the point A and the reflected ray passes through the point (5,3). Find coordinates of A.

Q.44. Obtain the equations of the lines passing through the intersection of lines  $4x - 3y - 1 = 0$  and  $2x - 5y + 3 = 0$  and equally inclined to the axes.

Q.45. Two lines passing through the point (2,3) make an angle of  $45^\circ$ . If the slope of one of the lines is 2. Then find the slope of the other line.

Q.46. Find the equations of the lines through the point of intersections of the lines  $x - y + 1 = 0$  and  $2x - 3y + 5 = 0$  and whose distance from the point (3,2) is  $\frac{7}{5}$ .

Q.47. Show that the perpendicular drawn from the point (4,1) on the line joining (6,5) and (2,-1) divides it in the ratio 8 : 5.

Q.48. Two consecutive sides of parallelogram are  $4x + 5y = 0$  and  $7x + 2y = 0$ . If the equation of one diagonal is  $11x + 7y = 9$ , then find the equation of other diagonal.

Q.49. Find the equation of line through the intersection of  $5x - 3y = 1$  and  $2x + 3y - 23 = 0$  and perpendicular to the line, whose equation is  $5x - 3y - 1 = 0$ .

Q.50. Find the equation of the lines through the point of intersection of the lines  $x - y + 1 = 0$  and  $2x - 3y + 5 = 0$  and whose distance from the point (3,2) is  $\frac{7}{5}$ .

Q.51. If a,b,c are variables such that  $3a + 2b + 4c = 0$ , then show that finally of lines given by  $ax + by + c = 0$  pass through a fixed point. Also, find the point.



Also, find the point.

Q.52. A person standing at the junction (crossing) of two straight paths represented by the equations  $2x - 3y + 4 = 0$  and  $3x + 4y - 5 = 0$  wants to reach the path, whose equation is  $6x - 7y + 8 = 0$  in the least time. Find the equation of path he should follow.

Q.53. First we plot points  $A(1,3)$  and  $B(-4,1)$  in the  $XY$  – plane. From the point  $A(1,3)$ , we draw a line parallel to  $Y$  – axis. And the point  $B(-4,1)$ , we draw a line parallel to  $X$  – axis. The point of intersection of two lines is on  $C$ , which is right angled at  $C$ .

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