

1. If the points $(a, 1)$, $(1, 2)$ and $(0, b+1)$ are collinear then show that $\frac{1}{a} + \frac{1}{b} = 1$.
2. If a line is equally inclined to the axis, show that its slope is ± 1 .
3. The perpendicular from the origin to a line meets it at the point $(-2, 9)$, find the equation of the line.
4. If the point $(a, 0)$ lies on the line containing the points $(at_1^2, 2at_1)$ and $(at_2^2, 2at_2)$, prove that $t_1 t_2 = -1$.
5. In what ratio is the line joining $(2,3)$ and $(4,1)$ divides the segment joining the points $(1,2)$ and $(4,3)$? (ans 1:1)
6. Find the coordinates of the vertices of a square inscribed in the triangle with vertices $A(0,0)$, $B(2,1)$ and $C(3,0)$; given that two of its vertices are on the side AC .
7. Find the equations of the straight lines which pass through the origin and trisect the intercept of the line $3x + 4y = 12$.
8. A straight line cut intercepts from the axes of coordinate s the sum of whose reciprocals is a constant. Show that it always passes through a fixed point.
9. The mid points of the sides of a triangle are $(2,1)$, $(-5,7)$ and $(-5, -5)$. Find the equation of its sides. (ans. $x-2=0$, $6x -7y+79=0$, $6x+7y+65=0$)
10. If the straight line through the point $P(3,4)$ makes and angle $\frac{\pi}{6}$ with x-axis and meets the line $12x + 5y + 10 = 0$ at Q find the length of PQ .(ans $132/(12\sqrt{3} + 5)$)
11. Find the distance of $(2,5)$ from $3x + y + 4 = 0$ measured equal to the line having slope $\frac{3}{4}$.(ans 5)
12. Find the distance of $(3,5)$ from $2x + 3y = 14$ measured parallel to a line $2y - x + 3 = 0$.(ans $\sqrt{5}$)
13. Find the equation of line which pass through the point $(2,3)$ and have intercept on axis which are equal in magnitude but opposite in sign.(ans $x - y + 1 = 0$)
14. Find the equation of line passing through $(22, -6)$,if the intercept on x-axis exceeds the intercept on y-axis by 5.(ans $6x + 11y = 16$)
15. Find the image of $(3,8)$ in the line $x + 3y = 7$.
16. Show that the perpendicular drawn from $(4,1)$ on the line joining of $(2,-1)$ and $(6,5)$ divides in the ration 5 :8.
17. Find the points on the x-axis , where distance from the line $4x+3y=12$ are 4 units. (ans $(8,0)$, $(-2,0)$)
18. Find the equations of the two sides of an equilateral triangle whose one side is $2x + y - 2 = 0$ and the vertex opposite to this side is $(-3,0)$ (ans $11y = (8 \pm 5\sqrt{3})(x + 3)$)
19. Find the image of point $(2, 1)$ with respect to the line mirror $x + y - 5 = 0$.(ans $(4,3)$)
20. A straight line drawn through the point $(2,1)$ is such that its point of intersection with the line $y - 2x + 6 = 0$ is at distance $3\sqrt{2}$ from this point. Find the slope of line.(ans 1 or 7)
21. Find the equation of a straight line passing through the point $(4,5)$ and equally inclined to the lines $3x = 4y + 7$ and $5y = 12x + 6$.(ans $9x - 7y = 1$ or $7x + 9y = 73$)
22. If the lines $ax + 2y + 1 = 0$, $bx + 3y + 1 = 0$ and $cx + 4y + 1 = 0$ are concurrent, show a, b, c are in A.P.
23. If the image point $(2,1)$ in a line is $(4,3)$, find equation of line. (ans. $x + y - 5 = 0$)

24. Find area of triangle formed by line $x + 2y - 3 = 0$, $3x - 2y + 7 = 0$, $y + 1 = 0$.(ans 12)
25. Find the value of k. so that distance of the point (4, 1) from the line $3x - 4y + k = 0$ is 4 units. (ans 12, -28)