



INDIAN SCHOOL MUSCAT
DEPARTMENT OF MATHEMATICS
CLASS XI
STRAIGHT LINES
WORKSHEET NO. 10

1. Find the slope of a line which makes an angle of 60° with the positive direction of y -axis measured anticlockwise. (Ans: $-\frac{1}{\sqrt{3}}$)
2. Find the value of x so that the line through $(x, 9)$ and $(2, 7)$ is parallel to the line through $(2, -2)$ and $(6, 4)$. (Ans: 10/3)
3. The line joining $(-5, 7)$ and $(0, -2)$ is perpendicular to the line joining $(1, -3)$ and $(4, y)$. Find y . (Ans: -4/3)
4. Find the equation of a straight line whose inclination is $\frac{5\pi}{6}$ and which cuts off an intercept of 4 units on negative direction of y -axis. (Ans: $x + \sqrt{3}y + 4\sqrt{3} = 0$)
5. If the line joining two points $A(2, 0)$ and $B(3, 1)$ is rotated about A in anti-clockwise direction through an angle of 15° , find the equation of the line in new position. (Ans: $y - \sqrt{3}x + 2\sqrt{3} = 0$)
6. (i) Find the equation of the line through the point $(-5, 1)$ and parallel to the line joining the points $(7, -1)$ and $(0, 3)$. (Ans: $4x + 7y + 13 = 0$)
(ii) Find the equation of the line through the point $(5, 2)$ and perpendicular to the line joining the points $(2, 3)$ and $(3, -1)$. (Ans: $x - 4y + 3 = 0$)
7. Find the equation of a straight line which passes through the point $(-3, 7)$ and makes intercepts on the coordinate axes equal in magnitude but opposite in sign. (Ans: $x - y + 10 = 0$)
8. Find the equations of the lines which pass through the point $(3, 4)$ and sum of whose intercepts on the axes is 14. (Ans: $4x + 3y = 24, x + y = 7$)
9. Find the equation of a line on which length of perpendicular from the origin is 4 units and the line makes an angle of 120° with the positive direction of x -axis. (Ans: $\sqrt{3}x + y = 8$)
10. Find the angle between the lines $y = (2 - \sqrt{3})(x + 5)$ and $y = (2 + \sqrt{3})(x - 7)$ (Ans: $\theta = 60^\circ$)
11. Find the distance of the point $P(4, 1)$ from the line $4x - y = 0$ measured along the line

making an angle of 135° with the positive direction of x -axis. (Ans: $3\sqrt{2}$ units)

12. Find the equation of one of the sides of an isosceles right angled triangle whose hypotenuse is given by $3x+4y=4$ and the vertex opposite to the hypotenuse is $(2, 2)$.
(Ans: $x-7y+12=0$)
13. A ray of light passing through the point $P(1, 2)$ reflects on the x -axis at the point A and the reflected ray passes through the point $Q(5, 3)$. Find the coordinates of A.
Ans: $(\frac{13}{5}, 0)$
14. Find the equation of the line passing through the point of intersection of the lines $2x+y=5$ and $x+3y+8=0$ and parallel to the line $3x+4y=7$. (Ans: $3x+4y+3=0$)
15. Find the of the line passing through the point of intersection of the lines $5x-6y-1=0$ and $3x+2y+5=0$ and perpendicular to the line $3x-5y+11=0$.
(Ans: $5x+3y+8=0$)
16. Reduce the equation $x+y+\sqrt{2}=0$ to normal form. Also find the perpendicular distance of the line from the origin and angle between perpendicular and the positive direction of x -axis.
(Ans: $x \cos 225^\circ + y \sin 225^\circ = 1$)
17. Find the image of the point $(4, -13)$ in the line $5x+y+6=0$, assuming the line to be a plane mirror.
Ans: $(-1, -14)$
18. If p is the length of the perpendicular from the origin on the line $\frac{x}{a} + \frac{y}{b} = 1$ and a^2, p^2, b^2 are in A.P, then prove that $a^4 + b^4 = 0$.
19. If the lines $ax+2y+1=0$, $bx+3y+1=0$ and $cx+4y+1=0$ are concurrent, show that a, b, c are in A.P.
20. Find the equation of a straight line which passes through the intersection of the two lines $3x-4y+1=0$ and $5x+y-1=0$ and cuts off equal intercepts on the coordinate axes.
(Ans: $23x+23y=11$)