

Straight line

1. Equations of diagonals of square formed by lines  $x = 0, y = 0, x = 1$  and  $y = 1$  are  
 (a)  $y = x, y + x = 1$  (b)  $y = x, x + y = 2$  (c)  $2y = x, y + x = \frac{1}{3}$  (d)  $y = 2x, y + 2x = 1$
2. If the middle points of the sides  $BC, CA$  and  $AB$  of the triangle  $ABC$  be  $(1, 3), (5, 7)$  and  $(-5, 7)$ , then the equation of the side  $AB$  is  
 (a)  $x - y - 2 = 0$  (b)  $x - y + 12 = 0$  (c)  $x + y - 12 = 0$  (d) None of these
3. The points  $A(1, 3)$  and  $C(5, 1)$  are the opposite vertices of rectangle. The equation of line passing through other two vertices and of gradient 2, is  
 (a)  $2x + y - 8 = 0$  (b)  $2x - y - 4 = 0$  (c)  $2x - y + 4 = 0$  (d)  $2x + y + 7 = 0$
4. Equation of the line which passes through the point  $(-4, 3)$  and the portion of the line intercepted between the axes is divided internally in the ratio 5:3 by this point, is  
 (a)  $9x + 20y + 96 = 0$  (b)  $20x + 9y + 96 = 0$  (c)  $9x - 20y + 96 = 0$  (d) None of these
5. One diagonal of a square is along the line  $8x - 15y = 0$  and one of its vertex is  $(1, 2)$ . Then the equation of the sides of the square passing through this vertex, are  
 (a)  $23x + 7y = 9, 7x + 23y = 53$  (b)  $23x - 7y + 9 = 0, 7x + 23y + 53 = 0$   
 (c)  $23x - 7y - 9 = 0, 7x + 23y - 53 = 0$  (d) None of these
6. The parallelism condition for two straight lines one of which is specified by the equation  $ax + by + c = 0$  the other being represented parametrically by  $x = \alpha t + \beta, y = \gamma t + \delta$  is given by  
 (a)  $a\gamma - b\alpha = 0, \beta = \delta = c = 0$  (b)  $a\alpha - b\gamma = 0, \beta = \delta = 0$  (c)  $a\alpha + b\gamma = 0$  (d)  $a\gamma = b\alpha = 0$
7. If straight lines  $ax + by + p = 0$  and  $x \cos \alpha + y \sin \alpha - p = 0$  include an angle  $\frac{\pi}{4}$  between them and meet the straight line  $x \sin \alpha - y \cos \alpha = 0$  in the same point, then the value of  $a^2 + b^2$  is equal to  
 (a) 1 (b) 2 (c) 3 (d) 4
8. The equation of bisectors of the angles between the lines  $|x| = |y|$  are  
 (a)  $y = \pm x$  and  $x = 0$  (b)  $x = \frac{1}{2}$  and  $y = \frac{1}{2}$  (c)  $y = 0$  and  $x = 0$  (d) None of these
9. A line  $L$  passes through the points  $(1, 1)$  and  $(2, 0)$  and another line  $L'$  passes through  $(\frac{1}{2}, 0)$  and perpendicular to  $L$ . Then the area of the triangle formed by the lines  $L, L'$  and  $y$ -axis, is  
 (a)  $\frac{15}{8}$  (b)  $\frac{25}{4}$  (c)  $\frac{25}{8}$  (d)  $\frac{25}{16}$
10. Equation of a straight line on which length of perpendicular from the origin is four units and the line makes an angle of  $120^\circ$  with the  $x$ -axis, is  
 (a)  $x\sqrt{3} + y + 8 = 0$  (b)  $x\sqrt{3} - y = 8$  (c)  $x\sqrt{3} - y = 8$  (d)  $x - \sqrt{3}y + 8 = 0$
11. If the lines  $ax + y + 1 = 0, x + by + 1 = 0$  and  $x + y + c = 0$  ( $a, b, c$  being distinct and different from 1) are concurrent, then  $\frac{1}{1-a} + \frac{1}{1-b} + \frac{1}{1-c} =$   
 (a) 0 (b) 1 (c)  $\frac{1}{a+b+c}$  (d) None of these
12. The three straight lines  $ax + by = c, bx + cy = a$  and  $cx + ay = b$  are collinear, if  
 (a)  $a + b + c = 0$  (b)  $b + c = a$  (c)  $c + a = b$  (d)  $a + b = c$
13. The line  $2x + 3y = 12$  meets the  $x$ -axis at  $A$  and  $y$ -axis at  $B$ . The line through  $(5, 5)$  perpendicular to  $AB$  meets the  $x$ -axis,  $y$ -axis and the  $AB$  at  $C, D$  and  $E$  respectively. If  $O$  is the origin of coordinates, then the area of  $OCEB$  is  
 (a) 23 sq. units (b)  $\frac{23}{2}$  sq. units (c)  $\frac{23}{3}$  sq. units (d) None of these
14. One side of a rectangle lies along the line  $4x + 7y + 5 = 0$ . Two of its vertices are  $(-3, 1)$  and  $(1, 1)$ . Then the equations of other sides are  
 (a)  $7x - 4y + 25 = 0, 4x + 7y = 11$  and  $7x - 4y - 3 = 0$  (b)  $7x + 4y + 25 = 0, 7y + 4x - 11 = 0$  and  $7x - 4y - 3 = 0$   
 (c)  $4x - 7y + 25 = 0, 7x + 4y - 11 = 0$  and  $4x - 7y - 3 = 0$  (d) None of these
15. The coordinates of the four vertices of a quadrilateral are  $(-2, 4), (-1, 2), (1, 2)$  and  $(2, 4)$  taken in order. The equation of the line passing through the vertex  $(-1, 2)$  and dividing the quadrilateral in two equal areas is  
 (a)  $x + 1 = 0$  (b)  $x + y = 1$  (c)  $x - y + 3 = 0$  (d) None of these