

## Topic :- STRAIGHT LINES

1. The range of values of  $\alpha$  for which the points  $(\alpha, 2 + \alpha)$  and  $(\frac{3\alpha}{2}, \alpha^2)$  lie on opposite sides of the line  $2x + 3y = 6$ , is  
 a)  $(-2, 1)$                       b)  $(-\infty, -2) \cup (0, 1)$     c)  $(-2, 0) \cup (1, \infty)$         d)  $(-1, 0) \cup (2, \infty)$
2. If the pair of straight lines  $ax^2 + 2hxy + by^2 = 0$  is rotated about the origin through  $90^\circ$ , then their equations in the new position are given by  
 a)  $ax^2 - 2hxy + by^2 = 0$   
 b)  $ax^2 - 2hxy - by^2 = 0$   
 c)  $bx^2 - 2hxy + ay^2 = 0$   
 d)  $bx^2 + 2hxy + ay^2 = 0$
3. A ray of light passing through the point  $(1, 2)$  is reflected on the  $x$ -axis at a point  $P$  and passes through the point  $(5, 3)$ , then the abscissa of a point  $P$  is  
 a) 3                                      b)  $13/3$                               c)  $13/5$                               d)  $13/4$
4. Two sides of an isosceles triangle are given by the equation  $7x - y + 3 = 0$  and  $x + y - 3 = 0$ . If its third side passes through the point  $(1, -10)$ , then its equations are  
 a)  $x - 3y - 7 = 0$  or,  $3x + y - 31 = 0$   
 b)  $x - 3y - 31 = 0$  or,  $3x + y - 7 = 0$   
 c)  $x - 3y - 31 = 0$  or,  $3x + y + 7 = 0$   
 d) None of these
5. The area of the triangle formed by  $y$ -axis, the straight line  $L$  passing through  $(1, 1)$  and  $(2, 0)$  and the straight line perpendicular to the line  $L$  and passing through  $(1/2, 0)$   
 a)  $\frac{25}{8}$  sq. units                      b)  $\frac{25}{4}$  sq. units                      c)  $\frac{25}{16}$  sq. units                      d)  $\frac{25}{2}$  sq. units
6. The equation  $12x^2 + 7xy + ay^2 + 13x - y + 3 = 0$  represents a pair of perpendicular lines. Then, the value of ' $a$ ' is  
 a)  $\frac{7}{2}$                                       b)  $-19$                                       c)  $-12$                                       d)  $12$
7. A beam of light is sent along the line  $x - y = 1$ . Which after refracting from the  $x$ -axis enters the opposite side by turning through  $30^\circ$  towards the normal at the point of incidence on the  $x$ -axis. Then, the equation of the refracted ray is  
 a)  $(2 - \sqrt{3})x - y = 2 + \sqrt{3}$                       b)  $(2 + \sqrt{3})x - y = 2 + \sqrt{3}$   
 c)  $(2 - \sqrt{3})x + y = 2 + \sqrt{3}$                       d) None of these
8. If the equation  $12x^2 + 7xy - py^2 - 18x + qy + 6 = 0$  represents a pair of perpendicular straight lines, then  
 a)  $p = 12, q = 1$                       b)  $p = 1, q = 12$                       c)  $p = -1, q = 12$                       d)  $p = 1, q = -12$
9. If the point  $(a, a)$  falls between the lines  $|x + y| = 4$ , then  
 a)  $|a| = 2$                                       b)  $|a| = 3$                                       c)  $|a| < 2$                                       d)  $|a| < 3$

10. Suppose  $A, B$  are two points on  $2x - y + 3 = 0$  and  $P(1, 2)$ , is such that  $PA = PB$  Then, the mid point of  $AB$  is
- a)  $(-\frac{1}{5}, \frac{13}{5})$       b)  $(-\frac{7}{5}, \frac{9}{5})$       c)  $(\frac{7}{5}, \frac{-9}{5})$       d)  $(\frac{-7}{5}, \frac{-9}{5})$
11. If non-zero numbers  $a, b, c$  are in HP, then the straight line  $\frac{x}{a} + \frac{y}{b} + \frac{1}{c} = 0$  always passes through a fixed point. That point is
- a)  $(1, -\frac{1}{2})$       b)  $(1, -2)$       c)  $(-1, -2)$       d)  $(-2, 2)$
12. If the lines  $x = a + m, y = -2$  and  $y = mx$  are concurrent, then least value of  $|a|$  is
- a) 0      b)  $\sqrt{2}$       c)  $2\sqrt{2}$       d) None of these
13. The equations  $a^2x^2 + 2h(a + b)xy + b^2y^2 = 0$  and  $ax^2 + 2hxy + by^2 = 0$  represent
- a) Two pairs of perpendicular straight lines  
b) Two pairs of parallel straight lines  
c) Two pairs of straight lines which are equally inclined to each other  
d) None of these
14. The value of  $k$  such that  $3x^2 - 11xy + 10y^2 - 7x + 13y + k = 0$  may represent a pair of straight lines, is
- a) 3      b) 4      c) 6      d) 8
15. The equations of the lines which are parallel to the line common to the pair of the lines given by  $6x^2 - xy - 12y^2 = 0$  and  $15x^2 + 14xy - 8y^2 = 0$  and at a distance of 7 units from it are
- a)  $3x + 4y = \pm 35$       b)  $5x - 2y = \pm 7$       c)  $2x - 3y = \pm 7$       d) None of these
16. The circumcentre of the triangle formed by the lines  $xy + 2x + 2y + 4 = 0$  and  $x + y + 2 = 0$ , is
- a)  $(0, 0)$       b)  $(-2, -2)$       c)  $(-1, -1)$       d)  $(-1, -2)$
17. If the sum of distances from a point  $P$  on two mutually perpendicular straight lines is 1 unit, then the locus of  $P$  is
- a) A parabola      b) A circle      c) An ellipse      d) A straight line
18. A line has slope  $m$  and  $y$ -intercept 4. The distance between the origin and the line is equal to
- a)  $\frac{4}{\sqrt{1-m^2}}$       b)  $\frac{4}{\sqrt{m^2-1}}$       c)  $\frac{4}{\sqrt{m^2+1}}$       d)  $\frac{4m}{\sqrt{1+m^2}}$
19. If the equation  $ax^2 + 2hxy + by^2 + 2gx + 2fy + c = 0$  represents a pair of parallel lines, then
- a)  $\frac{a}{h} = \frac{b}{h} = \frac{f}{g}$       b)  $\frac{a}{h} = \frac{h}{b} = \frac{f}{g}$       c)  $\frac{a}{h} = \frac{h}{b} = \frac{g}{f}$       d) None of these
20. If  $x_1, x_2, x_3$  as well as  $y_1, y_2, y_3$  are in GP with the same common ratio, then the points  $(x_1, y_1), (x_2, y_2)$  and  $(x_3, y_3)$
- a) Lie on a parabola      b) Lie on an ellipse  
c) Lie on a circle      d) Lie on a straight line