STRAIGHT LINES

SYNOPSIS

- If a line makes an angle θ ($0 \leq \theta < \pi$) with x-axis in the positive direction, then θ is called inclination of the line and

  $\tan\theta$ is called slope of the line. It is denoted by "m".
- X-axis or any line parallel to it is called a horizontal line, y-axis or any line parallel to it is called a vertical line, and all other lines are called oblique or inclined lines.
- The slope of x-axis or any line parallel to it is "Zero."
- The slope of y-axis or any line parallel to it is ($\tan 90^O$) not defined.
- The slope of a line passing through $A(x_1, y_1)$ & $B(x_2, y_2)$ is $\frac{y_2 - y_1}{x_2 - x_1}$ when $x_1 \neq x_2$
- If θ is the acute angle between the lines having slopes m_1, m_2 then

  $\tan\theta = \left|\frac{m_1 - m_2}{1 + m_1 m_2}\right|$
- Two nonvertical lines are parallel if their slopes are equal.
- Two non vertical lines are perpendicular if their product of slopes is "-1"
- The slope of a line perpendicular to a line having slope m is "-1/m".
- The equation of x-axis is $y = 0$.
- The equation of any horizontal line passing through (x_1, y_1) is $y = y_1$.
- The equation of y-axis is $x = 0$.
- The equation of any vertical line passing through (x_1, y_1) is $x = x_1$.
- The equation of the line passing through

  $A(x_1, y_1)$ and having slope 'm' is $y - y_1 = m(x - x_1)$.
- The equation of the line passing through origin and having slope 'm' is $y = mx$.
- The equation of the line passing through

  $A(x_1, y_1)$ & $B(x_2, y_2)$ is $(y - y_1)(x_2 - x_1) = (x - x_1)(y_2 - y_1)$.
- If a line cuts x-axis at A(a,o) & y-axis at B(o,b) then 'a' is called x-intercept & 'b' is called y-intercept.
- The equation of a straight line having slope 'm' and y-intercept 'c' is $y = mx+c$
- The equation of a straight line having slope 'm' and x-intercept 'a' is

  $y = m(x-a)$
- The equation of a straight line having

  x-intercept 'a' & y-intercept 'b' is $\frac{x}{a} + \frac{y}{b} = 1$
- The intercepts of a line $ax + by + c = 0$ on the axes are $-c/a$, $-c/b$ resepctively.
- The slope of a line $ax + by + c = 0$ is "$-a/b$"
- The equation of a line parallel to $ax + by + c = 0$ & passing through (x_1, y_1) is $a(x - x_1) + b(y - y_1) = 0$ (or) $ax + by + k = 0$ where $k = -ax_1 - by_1$.
- The equation of a line perpendicular to

  $ax + by + c = 0$ & passing through

  (x_1, y_1) is $b(x-x_1) - a(y-y_1) = 0$ (or)

  $bx - ay + k = 0$ where $k = ay_1 - bx_1$.

- The equation of a line parallel to $ax + by + c = 0$ and passing through origin is $ax + by = 0$.
- The equation of a line perpendicular to $ax + by + c = 0$ and passing through origin is $bx - ay = 0$.
- The area of the triangle formed by the line $\frac{x}{a}+\frac{y}{b}=1$ with the co-ordinate axes is $\frac{1}{2}|ab|$ Sq.units.
- The area of the triangle formed by $ax+by+c=0$ with the co-ordinate axes is $\frac{c^2}{2|ab|}$ Sq.units.
- The area of the parallelogram formed by the lines $a_1x + b_1y + c_1 = 0$, $a_2x + b_2 y + d_1=0$, $a_1x + b_1y + c_2= 0$, $a_2x + b_2 y + d_2= 0$ is $\left|\frac{(c_1-c_2)(d_1-d_2)}{a_1b_1-a_2b_1}\right|$ Sq.units.
- The equation of a line which is at a distance of 'p' units from the origin and α is ($0 < \alpha < 360^O$) the angle made by the perpendicular with positive direction of x-axis is $x \cos \alpha + y \sin \alpha = p$. (normal form)
- Equation of the line with inclination θ and passing through (x_1,y_1) is $\frac{x-x_1}{\cos\theta}=\frac{y-y_1}{\sin\theta}$ (symmetric form) where $\theta \in \left(0,\frac{\pi}{2}\right)\cup\left(\frac{\pi}{2},\pi\right)$.

  If we put $\frac{x-x_1}{\cos\theta}=\frac{y-y_1}{\sin\theta}=r$, then 'r' is the distance between fixed point (x_1, y_1) and the variable point (x, y).
- $x = x_1 + r \cos \theta$, $y = y_1 + r \sin \theta$ are the parametric equations of a line passing through (x_1, y_1)
- The ratio in which the line $L \equiv ax+by+c=0$ divides the line segment joining $A(x_1, y_1)$, $B(x_2, y_2)$ is $-L_{11} : L_{22}$ where

  $L_{11} = L(x_1, y_1)$ and

  $L_{22} = L(x_2, y_2)$.
- The points A, B lie in the same side or opposite side of the line $L = 0$ according as L_{11}, L_{22} have the same sign or opposite sign.
- Let $L \equiv ax+by+c=0$, $(c>0)$ be a line & $A(x_1, y_1)$ be a point.

  Then A lies in the origin side of $L = 0$ if $L_{11} > 0$ and A lies in the opposite to the origin side of $L = 0$ if $L_{11} < 0$.
- The perpendicular distance from the origin to the line $ax + by + c = 0$ is $\frac{|c|}{\sqrt{a^2+b^2}}$
- The perpendicular distance from a point (x_1, y_1) to the line $ax + by + c = 0$ is

  $\frac{|ax_1+by_1+c|}{\sqrt{a^2+b^2}}$
- The distance between the two parallel lines $ax + by + c_1 = 0$ and $ax + by + c_2 = 0$ is

  $\frac{|c_1-c_2|}{\sqrt{a^2+b^2}}$
- The point of intersection of the two non-parallel lines $a_1x + b_1y + c_1 = 0$ & $a_2x + b_2y + c_2 = 0$ is $\left(\frac{b_1c_2-b_2c_1}{a_1b_2-a_2b_1},\frac{c_1a_2-c_2a_1}{a_1b_2-a_2b_1}\right)$

  $(a_1b_2 - a_2b_1 \neq 0)$
- Three or more lines are said to be concurrent if they have a point in common. The common point is called the point of concurrence.

- If $L_1 = 0$, $L_2 = 0$ are two interesecting lines, then the equation of any line other than $L_1 = 0$ and $L_2 = 0$ passing through point of intersection can be taken as $L_1 + \lambda L_2 = 0$. Where λ -parameter.

- The condition that the lines $a_1x+b_1y+c_1=0$, $a_2x+b_2y+c_2=0$, $a_3x+b_3y+c_3=0$ to be concurrent is $\begin{vmatrix} a_1 & b_1 & c_1 \\ a_2 & b_2 & c_2 \\ a_3 & b_3 & c_3 \end{vmatrix} = 0$

- If 'θ' is an acute angle between the lines $a_1x + b_1y + c_1=0$, $a_2x + b_2y + c_2=0$ then $\cos\theta = \dfrac{|a_1a_2 + b_1b_2|}{\sqrt{a_1^2+b_1^2}\sqrt{a_2^2+b_2^2}}$ and

  $\tan\theta = \dfrac{|a_1b_2 - a_2b_1|}{|a_1a_2 + b_1b_2|}$

- The lines $a_1x+b_1y+c_1=0$, $a_2x+b_2y+c_2=0$ are parallel if $\dfrac{a_1}{a_2} = \dfrac{b_1}{b_2}$

- The lines $a_1x+b_1y+c_1=0$, $a_2x+b_2y+c_2=0$ are perpendicular if $a_1a_2+b_1b_2=0$

- $a_1x+b_1b+c_1=0$, $a_2x+b_2y+c_2=0$ represent the same line if $\dfrac{a_1}{a_2} = \dfrac{b_1}{b_2} = \dfrac{c_1}{c_2}$

- If (α, β) is the foot of the perpendicular from (x_1, y_1) to the line $ax + by + c = 0$ then

$$\frac{\alpha - x_1}{a} = \frac{\beta - y_1}{b} = \frac{-(ax_1 + by_1 + c)}{a^2 + b^2}$$

- If (α, β) is the image of (x_1, y_1) w.r.t. the line $ax+by+c=0$ then

$$\frac{\alpha - x_1}{a} = \frac{\beta - y_1}{b} = \frac{-2(ax_1 + by_1 + c)}{a^2 + b^2}$$

- The equation of angular bisectors of the two lines $a_1x+b_1y+c_1=0$ & $a_2x+b_2y+c_2=0$ are

$$\frac{a_1x + b_1y + c_1}{\sqrt{a_1^2 + b_1^2}} = \pm\frac{a_2x + b_2y + c_2}{\sqrt{a_2^2 + b_2^2}}$$

- Harmonic Conjugate :

  $A = (x_1, y_1)$, $B = (x_2, y_2)$ are two points $C(h, k)$ is a point dividing A and B in the ratio $l:m$. Then the point dividing AB in the ratio $\dfrac{-l}{m}$ is called the harmonic - conjugate of $C(h, k)$. with respect to AB.

- The equation to the lines passing through (x_1, y_1) and making an angle 'α' with the line $ax+by+c=0$ are given by

  $y-y_1 = m_1(x-x_1)$ where $m_1 = \dfrac{a + b\tan\alpha}{a\tan\alpha - b}$

  $y-y_1 = m_2(x-x_1)$ where $m_2 = \dfrac{b\tan\alpha - a}{b + a\tan\alpha}$

- If (x_1, y_1) and (x_2, y_2) are the vertices of an equilateral triangle, then the third vertex can be

$$\left(\frac{(x_1+x_2)-\sqrt{3}(y_1-y_2)}{2}, \frac{\sqrt{3}(x_1-x_2)+(y_1-y_2)}{2}\right)$$

(or)

$$\left(\frac{(x_1+x_2)+\sqrt{3}(y_1-y_2)}{2}, \frac{-\sqrt{3}(x_1-x_2)+(y_1+y_2)}{2}\right)$$

- The distance of the point (x_1, y_1) from the line $ax+by+c=0$ measured along a line making an angle 'α' with x-axis is $\left|\dfrac{ax_1 + by_1 + c}{a\,Cos\alpha + b\,Sin\alpha}\right|$

- The orthocentre of the triangle formed by the points $(0, 0)$, (x_1, y_1) and (x_2, y_2) is $\left(\dfrac{k(y_1-y_2)}{x_2y_1 - x_1y_2}, \dfrac{k(x_2-x_1)}{x_2y_1 - x_1y_2}\right)$ where

  $k = x_1x_2+y_1y_2$

- The figure formed by the lines $ax \pm by \pm c = 0$ is rhombus and its area is $\frac{2c^2}{|ab|}$ square units.

- If (x_1, y_1), (x_2, y_2), (x_3, y_3) are the vertices of a triangle, then the median through (x_1, y_1) is given by the equation.

$$\begin{vmatrix} x & y & 1 \\ x_1 & y_1 & 1 \\ x_2 & y_2 & 1 \end{vmatrix} + \begin{vmatrix} x & y & 1 \\ x_1 & y_1 & 1 \\ x_3 & y_3 & 1 \end{vmatrix} = 0$$

- Area of triangle formed by the lines $y = m_1x+c_1$, $y = m_2x + c_2$ and

 - $x = o$ is $\frac{1}{2}\frac{(c_1-c_2)^2}{|m_1-m_2|}sq.units$

 - $y = m_3x+c_3$ is $\frac{1}{2}\left|\sum\frac{(c_1-c_2)^2}{m_1-m_2}\right|sq.units$

- The area of the triangle formed by the three lines $a_1x+b_1y+c_1=0$, $a_2x+b_2y+c_2=0$ and $a_3x+b_3y+c_3=0$ is

$$\frac{\frac{1}{2}\begin{vmatrix} a_1 & b_1 & c_1 \\ a_2 & b_2 & c_2 \\ a_3 & b_3 & c_3 \end{vmatrix}^2}{|(a_1b_2-a_2b_1)(a_2b_3-a_3b_2)(a_3b_1-a_1b_3)|} \text{ s.u}$$

- The equation of the line parallel to $ax + by + c_1 = 0$, $ax + by + c_2 = 0$ and lying midway between them is $ax+by+\frac{c_1+c_2}{2}=0$

- A straight line is such that the sum of the reciprocals of its intercepts on the axes is K. Then it passes through the fixed point with coordinates is $\left(\frac{1}{k},\frac{1}{k}\right)$

- If a line which is at a distance 'p' from the origin, makes intercepts (a, b) on the axes, then $\frac{1}{p^2}=\frac{1}{a^2}+\frac{1}{b^2}$.

- • If a line cuts the axes at A and B and (x_1, y_1) is the midpont of AB, then equation of the line is $\frac{x}{x_1}+\frac{y}{y_1}=2$

 • If a line cuts the axes at A and B and $P(x_1,y_1)$ is a point on it dividing AB in the ratio l:m then the equation of the line is $\frac{mx}{x_1}+\frac{ly}{y_1}=l+m$

- If 'p' is the length of the altitude in an equilateral triangle, the length of its side is $\frac{2p}{\sqrt{3}}$ and area of the triangle is $\frac{p^2}{\sqrt{3}}$.

- The figure formed by the lines $a_1x + b_1y + c = 0$, $a_1x + b_1y + d = 0$, $a_2x + b_2y + c = 0$, $a_2x + b_2y + d = 0$ is a rhombus if $a_1^2+b_1^2=a_2^2+b_2^2$

- The figure formed by the lines x=a, x=b, y=c, y=d is always a rectangle. (They form a square if |a-b| = |c-d|). The point of intersection of the diagonals of the figure formed by the above lines is $\left(\frac{a+b}{2},\frac{c+d}{2}\right)$. Area of the figure formed = |a-b| |c-d|

- If two lines through a given point makes angles 'α' with a line having slope 'm', then the slopes of the two lines are $\frac{m+\tan\alpha}{1-m\tan\alpha},\frac{m-\tan\alpha}{1+m\tan\alpha}$

- If $a_1a_2+b_1b_2>0$ the equation of the bisector of the acute angle between the above lines is

$$\frac{a_1x+b_1y+c_1}{\sqrt{a_1^2+b_1^2}}=-\frac{a_2x+b_2y+c_2}{\sqrt{a_2^2+b_2^2}}$$

- If $a_1a_2+b_1b_2<0$, the equation of the bisector of the acute angle between the above lines is

$$\frac{a_1x+b_1y+c_1}{\sqrt{a_1^2+b_1^2}}=\frac{a_2x+b_2y+c_2}{\sqrt{a_2^2+b_2^2}}$$

- The equation of the bisector of the angle containing the origin between the lines $a_1x+b_1y+c_1=0$, $a_2x+b_2y+c_2=0$ where c_1, c_2 are of same sign is

$$\frac{a_1x+b_1y+c_1}{\sqrt{a_1^2+b_1^2}}=\frac{a_2x+b_2y+c_2}{\sqrt{a_2^2+b_2^2}}$$ and the

equation of the bisector of the angle not containing the origin is

$$\frac{a_1x+b_1y+c_1}{\sqrt{a_1^2+b_1^2}}=\frac{-\left(a_2x+b_2y+c_2\right)}{\sqrt{a_2^2+b_2^2}}$$

- The image of (a,b) w.r.t. x=y is (b,a)
- The image (a,b) w.r.t. to x + y = 0 is (-b,-a).
- The image of (a,b) w.r.t. to (0,0) is (-a,-b)
- The image of (a,b) w.r.t. x-axis is (a,-b)
- The image of (a,b) w.r.t. y-axis is (-a,b)
- The image of (x_1,y_1) w.r.t. to (x,y) is $(2x, x_1, 2y-y_1)$
- The point of concurrence of the altitudes in a triangle is called the orthocentre of the triangle.
- The orthocentre of a right angled triangle is the vertex containing the right angle.
- If 'O' is the orthocentre of triangle ABC, then out of the points O, A, B, C each is the orthocentre of the triangle formed by the other three points.
- $A(x_1, y_1)$, $B(x_2, y_2)$ and $C(x_3, y_3)$ are the vertices of triangle ABC then
  - Altitude through 'A' is $(x-x_1)(x_2-x_3)+(y-y_1)(y_2-y_3)=0$
  - Perpendicular Bisector of "BC' is $2x(x_2-x_3)+2y(y_2-y_3)=(x_2^2+y_2^2)-(x_3^2+y_3^2)$
- The equations of side BC, CA and AB of the ΔABC are $L_1=0$, $L_2=0$, $L_3=0$. The equation of altitude through A is $L_2(a_1a_3+b_1b_3)=L_3(a_1a_2+b_1b_2)$
- The equations of the altitudes of the triangle formed by the lines $a_1x+b_1y+c_1=0$, $a_2x+b_2y+c_2=0$ and $a_3x+b_3y+c_3=0$ are given by taking two by two of the identities in $(a_2a_3+b_2b_3)\ (a_1x+b_1y+c_1)=(a_1a_3+b_1b_3)(a_2x+b_2y+c_2)=(a_1a_2+b_1b_2)(a_3x+b_3y+c_3)$
- Orthocentre of the triangle (0,0), (x_1,y_1) and (x_2,y_2) is

$$\left[\frac{-(x_1x_2+y_1y_2)(y_1-y_2)}{x_1y_2-x_2y_1},\frac{(x_1x_2+y_1y_2)(x_1-x_2)}{x_1y_2-x_2y_1}\right]$$

- The point of concurrence of perpendicualr bisectors of the sides of triangle is the circumcentre of the triangle. It is the centre of the circle passing through the vertices of the triangle.
- The circumcentre of an acute angled triangle lies inside the triangle and that of an obtuse angled triangle lies outside the triangle.
- The circumcentre of a right-angled triangle is the mid point of the hypotenuse.
- The circumcentre of a triangle is equidistant from the vertices of the triangle.
- The centroid of a triangle lies on the line joining orthocentre and circumcentre dividing it in the ratio 2:1.

- The orthocentre of the triangle formed by the points (a,b)(a,c)(d,c) is(a,c) and circumcentre of triangle is $\left(\frac{a+d}{2},\frac{b+c}{2}\right)$
- i) The incentre of a triangle is the point of concurrence of the internal bisectors of the angles in the triangle. The incentre of a triangle is equidistant from the sides of the triangle.
  ii) The incentre of a triangle divides bisector of angle A in the ratio b+c:a.
- In triangle ABC,BC=a, CA=b, AB=c and $A=(x_1,y_1)$ $B=(x_2, y_2)$, $C=(x_3, y_3)$
  Then incentre= $\left(\frac{ax_1+bx_2+cx_3}{a+b+c},\frac{ay_1+by_2+cy_3}{a+b+c}\right)$
- Incentre of the triangle formed by (0,0) (a,0) and (0,b) is
  $$\left(\frac{a|b|}{|a|+|b|+\sqrt{a^2+b^2}},\frac{b|a|}{|a|+|b|+\sqrt{a^2+b^2}}\right)$$
- Excentre opposite to A =
  $$\left(\frac{-ax_1+bx_2+cx_3}{-a+b+c},\frac{-ay_1+by_2+cy_3}{-a+b+c}\right)$$
- In an equilateral triangle orthocentre, circumcentre, incentre, centroid are same
- If the lines joining any point 'O' to the vertices A,B,C of a triangle meet the opposite sides in D,E, F respectively then $\frac{BD}{DC}.\frac{CE}{EA}.\frac{AF}{FB}=1$
- If a transversal cuts the sides BC, CA, AB of a triangle in D, E, F respectively then $\frac{BD}{DC}\bullet\frac{CE}{EA}\bullet\frac{AF}{FB}=-1$

THEORY BITS

1. If the point (x_1, y_1) divides the line segment intercepted by a straight line between the coordinate axes into two equal parts, then its equation is
   1) $xx_1-yy_1 = x_1^2-y_1^2$
   2) $y_1x+x_1y=x_1y_1$
   3) $y_1x+x_1y=2x_1y_1$
   4) $xx_1+yy_1=x_1^2+y_1^2$
2. The variable line $\frac{x}{a}+\frac{y}{b}=1$ is such that the length of the portion of the line intercepted between the axes is k. The locus of the mid point of the portion is
   1) $2x^2+2y^2=k^2$ 2) $4x^2 + 4y^2 = k^2$
   3) $\frac{x^2}{4^2}+\frac{y^2}{4}=k^2$ 4) $x^2 + y^2 = k^2$
3. If a and b are the intercepts made by the straight line on the coordinate axes such that $\frac{1}{a}+\frac{1}{b}=\frac{1}{c}$ then the line passes through point
   1) (1,1) 2) (c,c)
   3) $\left(\frac{1}{c},\frac{1}{c}\right)$ 4) $\left(\frac{c}{a},\frac{c}{a}\right)$
4. If A(b,c) B(-a,0) C(a,0) are the vertices of triangle ABC and P,Q are the mid points of $\overline{AB}$, $\overline{AC}$ respectively and $\overline{BQ}$ is perpendicular to $\overline{CP}$ then
   1) $b^2+c^2=3a^2$ 2) $b^2+c^2=9a^2$
   3) $c^2-b^2 = 3a^2$ 4) $a^2+b^2=9c^2$
5. The lines (a+b-2c)x+(b+c-2a)y+(c+a-2b)=0, (b+c-2a)x+(c+a-2b)y+(a+b-2c)=0 and (c+a-2b)x+(a+b-2c)y+(b+c-2a)=0 where a,b,c,real numbers
   1 Form an equilateral triangle
   2. Concurrent
   3. Form a right angled triangle
   4. Form an isosceles triangle

6. A triangle is formed by the lines ax+by+c=0 lx+my+n=0, px+qy+r=0, then the straight line $(ax+by+c)(lp+mq) = (lx+my+n)(ap+bq)$ passes through

1) Incentre 2) Circumcentre

3) Orthocentre 4) Centroid

7. The orthocentre of the triangle formed by the points $A(a\cos\alpha, a\sin\alpha)$ $B(a\cos\beta, a\sin\beta)$ $C(a\cos\gamma, a\sin\gamma)$ is

1. $(\cos\alpha+\cos\beta+\cos\gamma , \sin\alpha+\sin\beta+\sin\gamma)$

2. $[a(\cos\alpha+\cos\beta+\cos\gamma),a(\sin\alpha+\sin\beta+\sin\gamma)]$

3. $[a(\cos\alpha+\sin\beta+\sin\gamma), a(\sin\alpha+\cos\beta+\cos\gamma]$

4. $(\cos\alpha \cos\beta \cos\gamma, \sin\alpha \sin\beta \sin\gamma)$

8. If the lines joining any point O to vertices A,B,C of a triangle meet the opposite sides in D,E,F, respectively then $\frac{BD}{DC}\cdot\frac{CE}{EA}\cdot\frac{AF}{FB} =$

1) 1 2) 2 3) -3 4) 3

9. If a transversal cuts BC, CA, AB of triangle ABC in D,E,F then $\frac{BD}{DC}\cdot\frac{CE}{EA}\cdot\frac{AF}{FB} =$

1) 1 2) -1 3) -3 4) 4

10. A straight line is such that the sum of the reciprocals of its intercepts on the axes is K. Then it passes through the fixed point with co-ordinates

1) $\left(\frac{1}{k},\frac{1}{k}\right)$ 2) $\left(k,\frac{1}{k}\right)$

3) (k, k) 4) $\left(\frac{1}{k},k\right)$

11. If a, b, c are all distinct, then

(b-c)x+(c a)y+(a-b)=0 and

$(b^3-c^3)x+(c^3-a^3)y+(a^3-b^3)=0$ represents the same line if

1) $a + b + c = 0$ 2) $a = b = c$

3) $a^2 + b^2 + c^2 = 0$ 4) $a^3 + b^3 + c^3 = 0$

12. The lines (a-b)x+(b-c)y+(c-a)=0, (b-c)x+(c-a)y+(a-b)=0, (c-a)x+(a-b)y+(b-c)=0

1) form an equilateral triangle

2) form an isosceles triangle

3) are concurrent

4) Scalane triangle

13. The figure formed by the lines $a_1x+b_1y+c=0$, $a_1x+b_1y+d=0$, $a_2x+b_2y+c=0$, $a_1x+b_1y+d=0$ form a rhombus. Then

1) $a_1+b_1 = a_2+b_1$

2) $a_1b_1 = a_2b_2$

3) $\frac{a_1}{b_1}=\frac{a_2}{b_2}$

4) $a_1^2+b_1^2 = a_2^2+b_2^2$

14. (a, b), (c, d), (e, f) are the vertices of an equilateral triangle. Then the orthocentre of the triangle is

1) $\left(\frac{a+d+f}{3},\frac{b+c+e}{3}\right)$

2) $\left(\frac{a+c+e}{3},\frac{b+d+f}{3}\right)$

3) $\left(\frac{a+c+f}{3},\frac{b+d+e}{3}\right)$

4) $\left(\frac{a+b+c}{3},\frac{d+e+f}{3}\right)$

15. A line cuts the coordinate axes in A and B. If AB = 2l, then the equation of the locus of the midpoint of AB is

1) $4x^2 + 4y^2 = l^2$ 2) $x^2 + y^2 = 4l^2$

3) $x^2 + y^2 = l^2$ 4) $x^2 + y^2 = 2l^2$

16. A line through the point (a, b) cuts the coordinate axes in A and B. Then the equation of the locus of the mid point of AB is

1) $\frac{a}{x}+\frac{b}{y}=2$ 2) $\frac{x}{a}+\frac{y}{b}=2$

3) $\frac{a}{x}+\frac{b}{y}=1$ 4) ax+by=1

17. The locus of the midpoint of the portion of the line $x\cos\alpha + y\sin\alpha = p$ intercepted between the axes is

1) $\frac{p^2}{x^2}+\frac{p^2}{y^2}=1$ 2) $\frac{p^2}{x^2}+\frac{p^2}{y^2}=4$

3) $x^2 + y^2 = 4p^2$ 4) $x^2 + y^2 = 2p^2$

18. A line through P (p,q) cuts the coordinate axes in A and B. If AB = $2l$ and p is the mid point of AB, then

1) $p^2 + q^2 = 4l^2$ 2) $4(p^2 + q^2) = l^2$

3) $p^2 + q^2 = l^2$ 4) $p^2 + q^2 = 2l^2$

19. A line makes intercepts a, b on the coordinate axes. Then the axes are rotated through a certain angle. In the new system the above line makes intercepts p, q on the new axes. Then

1) ab = pq 2) $\frac{1}{a}+\frac{1}{b}=\frac{1}{p}+\frac{1}{q}$

3) $\frac{1}{a^2}+\frac{1}{b^2}=\frac{1}{p^2}+\frac{1}{q^2}$ 4) $\frac{1}{a^2}-\frac{1}{b^2}=\frac{1}{p^2}-\frac{1}{q^2}$

20. If P_1, P_2 be the distances between the parallel sides and θ is the angle between two adjacent sides of a parallelogram, then its area is

1) $P_1 P_2 \sin\theta$ 2) $P_1 P_2 \cos\theta$

3) $P_1 P_2 / \sin\theta$ 4) $P_1 P_2 / \cos\theta$

21. The locus of the mid points of the portion of a line distant P from the origin intercepted between the axes is

1) $p^2(x^2+y^2) = 4x^2y^2$

2) $p^2(x^2+y^2) = 2x^2y^2$

3) $4(x^2+y^2) = p^2x^2y^2$

4) $2(x^2+y^2) = p^2x^2y^2$

22. If the base of an isosceles triangle is of length 2P and the length of the altitude dropped to the base is q, then the distance from the mid point of the base to the side of the triangle is

1) $\frac{pq}{\sqrt{p^2+q^2}}$ 2) $\frac{2pq}{\sqrt{p^2+q^2}}$

3) $\frac{3pq}{\sqrt{p^2+q^2}}$ 4) $\frac{4pq}{\sqrt{p^2+q^2}}$

23. A variable line drawn through the point of intersection of the lines $\frac{x}{a}+\frac{y}{b}=1, \frac{x}{b}+\frac{y}{a}=1$ meets the coordinate axes in A and B. Then the locus of the mid point of AB is

1) 2xy(a+b)=ab(x+y) 2) xy(a+b)=ab(x-y)

3) xy(a+b)=ab(x+y) 4)xy(a+b)=2ab(x+y)

24. The product of the perpendiculars drawn from $\left(\sqrt{a^2-b^2},0\right),\left(-\sqrt{a^2-b^2},0\right)$ to

$\frac{x}{a}\cos\alpha+\frac{y}{b}\sin\alpha=1$

1. $2b^2$ 2) $4b^2$ 3) b^2 4) b^2+a^2

25. p is the perpendicular distance from the origin to $\frac{x}{a}+\frac{y}{b}=1$ then $\frac{1}{a^2}+\frac{1}{b^2}=$

1) p^2 2) $1/p^2$ 3) p 4) 1/p

26. $\frac{x}{a}+\frac{y}{b}=1, \frac{x}{b}+\frac{y}{a}=1$ and x = y are concurrent then the point of concurrency is

1) (ab, ab) 2) (b/a, a/b)

3) $\left(\frac{ab}{a+b},\frac{ab}{a+b}\right)$ 4) $\left(\frac{1}{ab},\frac{1}{ab}\right)$

27. The straight line through A(a,b) intersects the line through B(b,d) at 'P' at right angles. The locus of P is

1) (x-a)(x-b)+(y-b)(y-d)=0

2) (x-a)(x-c)+(y-b)(y-d)=0

3) (x-b)(x-d)+(y-a)(y-d)=0

4) (x-b)(x-d)+(y-a)(y-c)=0

28. If the medians AD, BE of a Δ with vertices A=(0,p), B=(0,0), C=(q,0) are mutually perpendicular if

1) $p^2=2q^2$ 2) $q^2=2p^2$

3) p+2q=0 4) p-3q=0

29. If ax+by+c=0 is parallel to x-axis then which of the following is defined

1) $\frac{a^2-c^2}{c^2+b^2}$ 2) $\frac{b^2-c^2}{a^2}$

3) $\frac{4b^2+c^2}{\sqrt{abc}}$ 4) $\frac{\sqrt{a+c^2}}{a}$

30. The equation of the line passing through $(at_1^2, 2at_1), (at_2^2, 2at_2)$ is

1. $2x-(t_1+t_2)y+2at_1t_2 = 0$
2. $2x+(t_1+t_2)y-2at_1t_2 =0$
3. $2x-(t_1+t_2)y-2at_1t_2 =0$
4. $x-(t_1+t_2)y+at_1t_2 = 0$

31. The equation to the perpendicular bisector of the line segment of the line $\frac{x}{a}+\frac{y}{b}=1$ cut off by the axes is

1) $ax-by-a^2+b^2=0$
2) $ax+by-a^2+b^2=0$
3) $2ax+2by-a^2+b^2=0$
4) $2ax-2by-a^2+b^2=0$

32. The straight line passing through $P(x_1,y_1)$ and making an angle α with x-axis intersects $Ax+By+C=0$ in Q then PQ=

1) $\frac{|Ax_1+By_1+C|}{\sqrt{A^2+B^2}}$

2) $\frac{|Ax_1+By_1+C|}{\sqrt{A\cos\alpha+B\sin\alpha}}$

3) $\frac{|Ax_1+By_1+C|}{|A\cos\alpha+B\sin\alpha|}$

4) $\frac{|Ax_1+By_1+C|}{\sqrt{A^2\cos^2\alpha+B^2\sin^2\alpha}}$

33. $u\equiv a_1x+b_1y+c_1=0$, $v\equiv a_2x+b_2y+c_2=0$ and $\frac{a_1}{a_2}=\frac{b_1}{b_2}=\frac{c_1}{c_2}$ then u+kv=0 represents

1) u = 0
2) a family of concurrent lines
3) a family of parallel lines
4) a family of lines intersecting at origin

34. In ΔABC, S is a point satisfying SA=SB=SC then $\frac{(AB)(BC)(CA)}{(SA)\Delta}=$

1) 1 2) 2 3) 3 4) 4

35. The area of the parallelogram formed by the lines $ax+by+c_1=0$, $ax+by+c_2=0$, $px+qy+r_1=0$, $px+qy+r_2=0$

1) $\left|\frac{(c_1-c_2)(r_1-r_2)}{aq-bp}\right|$ 2) $\frac{|(c_1-c_2)(r_1-r_2)|}{2|aq-bp|}$

3) $\left|\frac{(c_1-c_2)(r_1-r_2)}{ab-pq}\right|$ 4) $\left|\frac{(c_1-r_1)(c_2-r_2)}{ab-bq}\right|$

36. The area of the triangle formed by the lines $y=m_1x+c_1$, $y=m_2x+c_2$ and x=0 is

1) $\frac{|c_1-c_2|}{2|m_1-m_2|}$ 2) $\frac{(c_1-c_2)^2}{2(m_2-m_1)^2}$

3) $\frac{(c_1-c_2)^2}{2|m_1-m_2|}$ 4) $\frac{(c_1-c_2)^2}{|m_2-m_1|}$

37. The condition that the lines $ax+hy+g=0$ $hx+by+f=0$ and $gx+fy+c=0$ to be concurrent is

1) $abc+2fgh-af^2-bg^2-ch^2=0$
2) abc=2fgh 3) $h^2=ab$
4) $af^2=bg^2$

38. If $a+b+c\neq 0$, $ax+by+c=0$ $bx+cy+a=0$, $cx+ay+b=0$ are concurrent then $\frac{a^2+b^2+c^2}{ab+bc+ca}=$

1) 1/2 2) 2
3) 1 4) 0

39. Three different lines $px+qy+r=0$ $qx+ry+p=0$ and $rx+py+q=0$ are concurrent then

1) $p^3+q^3+r^3 = 3pqr$
2) $p^2+q^2+r^2-pq-qr-rp=0$
3) $p+q+r=0$
4) All of the above

40. Two lines $x\cos\alpha + y\sin\alpha = p$, $x\cos2\alpha + y\sin2\alpha = q$ include an angle of

1) α 2) 3α

3) $\frac{\alpha}{p-q}$ 4) $\frac{p+q}{\alpha}$

41. If $\frac{ax}{\sqrt{a^2+b^2}}+\frac{by}{\sqrt{a^2+b^2}}=\frac{-c}{\sqrt{a^2+b^2}}$ is perpendicular from a straight line then

1) a,b,c>0 2) a>0, b>0, c$\leq$0

3) c < 0 4) a, b>0, c $\neq$ 0

42. The angle between the lines x Cosα + ysinα = p_1, x Cosβ+ySinβ = p_2 where ($\alpha>\beta$) is

1) α-β 2) α+β

3) $\alpha\beta$ 4) 2α-β

43. The diagonals of the paralelogram whose sides are $lx+my+n_1=0$, $lx+my+n_2=0$, $mx+ly+n_1=0$ and $mx+ly+n_2=0$, include an angle of

1. $\pi/3$ 2) $\pi / 2$

3. $\operatorname{Tan}^{-1}\left(\frac{l^2-m^2}{l^2+m^2}\right)$ 4) $\operatorname{Tan}^{-1}\left(\frac{2lm}{l^2+m^2}\right)$

44. The foot of perpendicular from the origin to ax+by+c=0 is

1) $\left(\frac{-c}{a^2+b^2},\frac{-c}{a^2+b^2}\right)$

2) $\left(\frac{-bc}{a^2+b^2},\frac{-ac}{a^2+b^2}\right)$

3) $\left(\frac{ac}{a^2+b^2},\frac{bc}{a^2+b^2}\right)$

4) $\left(\frac{-ac}{a^2+b^2},\frac{-bc}{a^2+b^2}\right)$

KEY

1) 3	2) 2	3) 2	4) 2	5) 2
6) 3	7) 2	8) 1	9) 2	10) 1
11)1	12)3	13) 4	14) 2	15) 3
16) 1	17) 2	18) 3	19) 3	20) 3
21) 1	22) 1	23) 1	24) 3	25) 2
26) 3	27) 1	28) 2	29) 1	30) 3
31) 4	32) 3	33) 3	34) 4	35) 1
36) 3	37) 1	38) 3	39) 4	40) 1
41) 3	42) 1	43) 2	44) 4	

LEVEL-1

1. If the slope of a line is $\frac{-1}{\sqrt{3}}$ then its inclination is

1) $\frac{\pi}{3}$ 2. $\frac{5\pi}{6}$ 3. $\frac{2\pi}{3}$ 4. $\frac{3\pi}{4}$

2. The inclination of a line is 15^{O}. Its slope is

1) $\sqrt{3}-1$ 2) $1+\sqrt{3}$ 3) $3-2\sqrt{3}$ 4) $2-\sqrt{3}$

3. If the straight line y=mx+c passes through the points (3,-4) and (-1,2) then value of m is

1) $\frac{-2}{3}$ 2) $\frac{-3}{2}$ 3) $\frac{3}{2}$ 4) $\frac{2}{3}$

4. If the line passing through the points (-8,3) (2,1) is parallel to the line passing through the points (11,-1) (k,0) then the value of k is

1) 5 2) 7 3) 5/2 4) 6

5. A=(7,1) B=(-3,3) are two points. If the point (k,1) lies on the perpendicular bisector of AB. Then the value of k is

1) 3 2) 6 3) 2 4) -4

6. The equation of the horizontal line passing through the point (4,-7) is

1) y-7=0 2) y+7=0 3) y-4=0 4) y+4=0

7. If the straight line (3x+4y+5)+k(x+2y-3)=0 is parallel to x-axis then the value of k is

1) 1 2) -3 3) 4 4) 2

8. Equation of the vertical line passing throught he point (-4,5) is

1) x+4=0 2) x-4=0 3) x-5=0 4) x+5=0

9. If the line (3x+14y+7)+k(5x+7y+6)=0 is parallel to y axis then the value of k is

1) 1/3 2) -3/5 3) -2 4) 2

10. The vertices of a triangle are (2,0) (0,2) (4,6) then the equation of the median through the vertex (2,0) is

1) x+y-2=0 2)x=2

3) x+2y-2=0 4) 2x+y-4=0

11. x intercept of the line parallel to 4x+7y=9 and passing through (2,3) is

1) $\frac{25}{4}$ 2) $\frac{17}{4}$ 3) $\frac{29}{4}$ 4) $\frac{29}{7}$

12. If the straight line (x+y+1)+λ (2x-y-1)=0 is perpendicualr to 2x+3y-8=0 then λ =

1) 5 2) -5

3) 4 4) -4

13. Equation of a line which passes through the point (-3,8) and cut off positive intercepts on the axes whose sum is 7 is

1) 3x-4y=12 2) 4x+3y=12

3) 3x+4y=12 4) 4x-3y=12

14. A line through (2,2) is perpendicular to the line 3x+y=3. Its y-intercept is

1) $\frac{1}{3}$ 2) $\frac{2}{3}$ 3) 1 4) $\frac{4}{3}$

15. Equation of the line perpendicular to

3x+4y-10=0 with x-intercept $\frac{-3}{7}$ is

1) 4x-3y+12/7=0 2) 4x-3y+15/7=0

3) 4x-3y+5/7=0 4)4x-3y+11/7=0

16. Equation of the line which makes an angle 45^0 with x-axis and having an intecept-3 on Y-axis is

1) x-y-3=0 2) x-y+3=0

3) x+y+3=0 4) x+y-3=0

17. Equation of the line with slope $\frac{-3}{2}$ and x-intercept 5 is

1) 3x+2y=15 2) 3x-2y=15

3) 3x+2y=10 4) 3x+2y=12

18. Equation of the line with slope 1/3 and divides the join of the points (0,2) (5,-3) in the ratio 4:7 is

1) 11x-33y-14=0 2) 11x-33y+14=0

3) 11x-33y+17=0 4) 11x-33y-17=0

19. A line passing through (-4,3) have intercepts on the axes equal in magnitude but opposite in sign then the area of the triangle formed by the line with the co-ordinate axes in square units

1) $\frac{49}{8}$ 2) $\frac{25}{6}$ 3) $\frac{49}{4}$ 4) $\frac{49}{2}$

20. Equation of the line passing through the point (1,2) and having intercepts on the axes in the ratio 2:3 is

1) 3x+4y=11 2) 3x+2y=7

3) 3x-2y=7 4) 4x+y=6

21. If the line (x-y+1) + k (y-2x+4) = 0 makes equal intercept on the axes then the value of k is

1) $\frac{1}{3}$ 2) $\frac{3}{4}$ 3) $\frac{1}{2}$ 4) $\frac{2}{3}$

22. Equation of the line having intercepts a, b on the axes such that a+b=5 and ab = $\frac{21}{4}$ is

1) 3x+2y=6 2) 2x+3y=6

3) 14x+6y=21 4) x+4y=4

23. The points (3,2) (-2,-1) are two opposite vertices of a rectangle if the other two vertices lies on 3x+5y+k=0 then the value of k is

1) 3 2) -4 3) -5 4) 7

24. Equation of the line on which the length of the perpendicular from origin is 5 and the angle which this perpendicular makes with the x axis is 60^{O}

1) $x+\sqrt{3}y=12$ 2) $\sqrt{3}\,x+y=10$

3) $x+\sqrt{3}y=8$ 4) $x+\sqrt{3}\,y=10$

25. Normal form of $x-\sqrt{3}\,y+6=0$ is

1) x cos $\frac{\pi}{3}$ + y sin $\frac{\pi}{3}$ = 2

2) x cos $\frac{2\pi}{3}$ + y sin $\frac{2\pi}{3}$ = 3

3) x cos $\frac{3\pi}{4}$ + y sin $\frac{3\pi}{4}$ = 6

4) x cos $\frac{5\pi}{6}$ + y sin $\frac{5\pi}{6}$ = 2

26. If the straight line drawn through the point $P\left(\sqrt{3},2\right)$ making an angle $\frac{\pi}{6}$ with x-axis meets the line $\sqrt{3}$x-4y+8=0 at Q. Then PQ is

1) 4 2) 5 3) 6 4) 9

27. The point on the line x+y=4 that lie at a unit distance from the line 4x+3y-10=0 is

1) (1, 3) 2) (-7, 11) 3) (11, -7) 4) (2, 2)

28. If the distances from the points (6,-2) and (3,4) to the lines 4x+3y=12, 4x-3y=12 are d_1 and d_2 respectively then $d_1:d_2$ =

1) 2:3 2) 4:5 3) 3:7 4) 1:2

29. The ratio in which the line 3x+4y-7=0 divides the line joining the points (1,2) (2,3) is

1) 4:11 Internally 2) 4:11 Externally

3) 7:11 Internally 4) 7:11 Externally

30. The ratio in which the line joining the points (-1,-1) (2,1) divides the line joining the points (3, 4) and (1,2) is

1) 7:5 externally 2) 7:3 externally

3) 7:5 internally 4) 7:4 externally

31. If the line 3x+4y-8=0 is denoted by L, then the points (2,-5) (-5,2)

1) lie on L

2) lie on same side of L

3) lie on opposite sides of L

4) equidistant from L

32. The distance between the parallel lines 8x+6y+5=0 and 4x+3y-25=0 is

1) $\frac{7}{2}$ 2) $\frac{9}{2}$ 3) $\frac{11}{2}$ 4) $\frac{5}{4}$

33. If the distance between the lines 2x+y+k=0, 6x+3y+2=0 is $\frac{7}{3\sqrt{5}}$ then the value of k is

1) 5 2) 3 3) 6 4) 7

34. The angle between the diagonals of a quadriateral formed by the lines $\frac{x}{a}+\frac{y}{b}=1$, $\frac{x}{b}+\frac{y}{a}=1$, $\frac{x}{a}+\frac{y}{b}=2$, $\frac{x}{b}+\frac{y}{a}=2$ is

1) $\frac{\pi}{4}$ 2) $\frac{\pi}{6}$ 3) $\frac{\pi}{3}$ 4) $\frac{\pi}{2}$

35. Circumference of the circle touching the lines 3x+4y-3=0, 6x+8y-1=0 is

1) $\frac{13}{5}$ 2) $\frac{18}{7}$ 3) $\frac{19}{6}$ 4) $\frac{11}{7}$

36. Equation to the line passing through the point of intersection of the lines $\frac{x}{3}-\frac{y}{4}=1$, $\frac{x}{4}-\frac{y}{3}=1$, and origin is

1) x-y=0 2) x+y=0

3) 2x+y=0 4) 2x+3y=0

37. The point of concurrence of the lines $\frac{x}{3}+\frac{y}{4}=1$, $\frac{x}{4}+\frac{y}{3}=1$, x = y is

1) $\left(\frac{4}{3},\frac{4}{3}\right)$ 2) $\left(\frac{2}{7},\frac{2}{7}\right)$

3) $\left(\frac{12}{7},\frac{12}{7}\right)$ 4) $\left(\frac{7}{12},\frac{7}{12}\right)$

38. For all values of 'a' the set of straight lines (3a+1) x - (2a+3) y + 9-a=0 passes through the point

1) (3, 4) 2) (4,2) 3) (3,3) 4) (1,2)

39. If 4a+5b+6c=0 then the set of lines ax+by+c=0 are concurrent at the point

1) $\left(\frac{2}{3},\frac{5}{6}\right)$ 2) $\left(\frac{1}{3},\frac{1}{2}\right)$ 3) $\left(\frac{1}{2},\frac{4}{3}\right)$ 4) $\left(\frac{1}{3},\frac{7}{3}\right)$

40. If the lines y=x+1, 2x+y=16, y=αx-4 are concurrent then the value of α is

1) 3 2) 5 3) 1 4) 2

41. If θ is an acute angle between the lines y=2x+3, y=x+1 then the value of tanθ =

1) $\frac{2}{3}$ 2) $\frac{1}{3}$ 3) $\frac{3}{4}$ 4) $\frac{1}{2}$

42. The angle between the line passing through the points (1, -2) (3,2) and the line x+2y-7=0 is

1) $\frac{\pi}{4}$ 2) $\frac{\pi}{6}$ 3) $\frac{\pi}{2}$ 4) $\frac{\pi}{3}$

43. The acute angle between the lines lx + my = l+m, l (x-y) + m (x+y) = 2m is

1) $\frac{\pi}{4}$ 2) $\frac{\pi}{6}$ 3) $\frac{\pi}{2}$ 4) $\frac{\pi}{3}$

44. The equation of the line equidistant from the lines 2x+3y-7=0, 2x+3y-9=0 is

1) 2x+3y-1=0 2) 2x+3y-6=0

3) 2x+3y-10=0 4) 2x+3y-8=0

45. The lines $(p-q)x + (q-r)y + (r-p) = 0$
$(q-r)x + (r-p)y + (p-q) = 0$
$(r-p)x + (p-q)y + (q-r) = 0$

1) Form an equilaterial triangle
2) Form an Isosceles triangle
3) Concurrent
4) Form a right angled triangle

46. The equation of the straight line whose inclination is $\pi/4$ and x-intercept is 4 is

1) $x+y+4=0$ 2) $x+y-4=0$
3) $x-y-4=0$ 4) $x-y+4=0$

47. A straight line passes through (4,5) and makes an angle 60^O with x-axis in the positive direction, its equation in the symmetric form is

1) $(x-4)/\sqrt{3} = (y+5)$
2) $(x-4)/\sqrt{3} = 5-y$
3) $(x+4)/\sqrt{3} = y+5$
4) $x-4 = (y-5)/\sqrt{3}$

48. A straight line is such that its distance of 5 units from the origin and its inclination is 135^O. The intercepts of the line on the co-ordinate axes are

1) 5, 5 2) $\sqrt{2}, \sqrt{2}$
3) $5\sqrt{2}, 5\sqrt{2}$ 4) $5/\sqrt{2}, 5/\sqrt{2}$

49. The distance between the straight lines $y=mx+c_1$ and $y = mx+c_2$ is $|c_1-c_2|$, when

1) m=0 2) m=1 3) m=2 4) m=-2

50. The equation of the line which is parallel to $5x+12y+1=0$ and $5x+12y+7=0$ and lying midway between them is

1) $5x+12y+13=0$ 2) $5x+12y-4=0$
3) $5x+12y+4=0$ 4) $5x+12y-6=0$

51. If p, q, r are distinct, then $(q-r)x + (r-p)y + (p-q) = 0$ and $(q^3-r^3) + (r^3-p^3)y + (p^3-q^3) = 0$ represents the same line if

1) $p+q+r=0$ 2) $p=q=r$
3) $p^2+q^2+r^2=0$ 4) $p^3+q^3+r^3=0$

52. Image of (1,2) w.r.t. (-2, -1) is

1) (0,5) 2) (-4,-3)
3) (-5,-4) 4) (-4,-5)

53. $\mu \equiv a_1x+b_1y+c_1=0$ and $\lambda \equiv a_2x+b_2y+c_2=0$ are two straight lines such that $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$ then $\mu + k\lambda = 0$, $k \varepsilon R$ is

1) a straight line different from μ and λ
2) not a straight line
3) is a straight line concurrent with μ and λ
4) the same straight line $\mu = 0$

54. Equation of a diameter of the circum circle of the triangle formed by the lines $3x+4y-7=0$, $3x-y+5=0$ and $8x-6y+1=0$ is

1) $3x-y-5=0$ 2) $3x+y+5=0$
3) $3x-y+5=0$ 4) $3x+y-5=0$

55. If the lines $ax+by+c = 0$, $bx+cy+a = 0$ and $cx+ay+b=0$ $(a\neq b\neq c)$ are concurrent then the point of concurrency is

1) (0,0) 2) (1,1) 3) (2,2) 4) (-1,-1)

56. The points (0, 8/3), (1, 3) and (82, 30) are the vertices of

1) obtuse angled triangle
2) acute angled triangle
3) right angled triangle
4) set of collinear points

57. The points (2,3), (8,11), (5,7) form

1) a right angled triangle
2) isosceles triangle
3) equilateral triangle
4) set of collinear points

58. A = (5,3), B=(11, -5), C=(12, t). If $\angle ACB = 90^O$, then t =

1) 4 2) -4 3) -2 4) 2

59. L_1 and L_2 are two intersecting lines and the angle between the image of L_1 w.r.t. L_2 and that of L_2 w.r.t. L_1 is 45^O. Then the angle between L_1 and L_2 is

1) 20^O 2) 15^O 3) 45^O 4) 60^O

60. L_1 and L_2 are two intersecting lines. If the image of L_1 w.r.t. L_2 and that of L_2 w.r.t. L_1 concide, then the angle between L_1 and L_2 is

1) 35^O 2) 60^O

3) 90^O 4) 45^O

61. If the orthocentre and circumcentre of a triangle are (2,-3), (5,6) then the centroid is

1) (2,7) 2) $\left(-3,-\frac{4}{3}\right)$

3) (4,3) 4) (-1, -3)

62. The number of different straight lines that are formed with A (2,3), B(3,4), C(5,6), D(3,7) are

1) 1 2) 0 3) 3 4) 4

63. If the algebraic sum of the perpendicular distances from the points (2,0) (0,2) and (4,4) to a variable line is 'O', then the line passes through the fixed point

1) (1,1) 2) (3,3)

3) (2,2) 4) (0,0)

64. The equation to the sides of a triangle are x-3y=0, 4x+3y-5=0 and 3x+y=0 then the line 3x-4y=0 passes through

1) The incentre
2) The centroid
3) The circumcentre
4) The orthocentre of the triangle

KEY

1) 2	2) 4	3) 2	4) 4	5)1
6) 2	7) 2	8) 1	9) 3	10) 2
11) 3	12) 2	13) 2	14) 4	15) 1
16) 1	17) 1	18) 1	19) 4	20) 2
21) 4	22) 3	23) 2	24) 4	25) 2
26) 3	27) 2	28) 4	29) 2	30) 1
31) 2	32) 3	33) 2	34) 4	35) 4
36) 2	37) 3	38) 1	39) 1	40) 4
41) 2	42) 3	43) 1	44) 4	45) 3
46) 3	47) 4	48) 3	49) 1	50) 3
51) 1	52) 3	53) 4	54) 3	55) 2
56) 4	57) 4	58) 2	59) 2	60) 2
61) 3	62) 4	63) 3	64) 4	

HINTS

5. Substitute (k, 1) in the equation of the perpendicular bisector of A and B.

7. Coefficient of x = 0

9. Coefficient of y = 0

13. Verification with the options.

19. Let the intercepts be a, -a

20. Verification

21. Coefficient of x = coefficient of y

22. Verification from the options.

23. Substitute mid piont of (3, 2) (-2, -1) in the equation.

24. Normal form $x\cos\alpha + y\sin\alpha = p$.

27. Verification

29. Applying $\frac{m}{n} = -\left[\frac{ax_1+by_1+c}{ax_2+by_2+c}\right]$

34. The quadriateral formed by the lines is Rhombus.

35. Distance between parallel lines is equals to the diamter of the circle.

38. Verification

45. Sum of the coefficient of x, y and constant term in each equation is zero.

46. Equation of the line y = m(x-a)

47. Symmetric form $\frac{x-x_1}{\cos\theta} = \frac{y-y_1}{\sin\theta}$

48. Normal form

49. Verification

50. Verification

51. $\frac{b^3-c^3}{b-c} = \frac{c^3-a^3}{c-a} = \frac{a^3-b^3}{a-b}$

52. Verification

53. As $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$ then the two lines represent one line only.

54. Given lines forms a right angled triangle.

55. Verification.

LEVEL-II

1. If the inclination of the line

(2-λ) x-(1-λ) + (5-2λ) = 0 is $\frac{3\pi}{4}$ then the value of λ is

1) $\frac{5}{2}$ 2) $\frac{-3}{2}$ 3) $\frac{2}{3}$ 4) $\frac{3}{2}$

2. If the slope of the line

$\left(\frac{1}{a}+\frac{k}{b}\right)x+\left(\frac{1}{b}+\frac{k}{a}\right)y-(1+k)=0$ is -1 then the value of k is

1) 2 2) -1 3) 1 4) -2

3. The angle made by the line passing through the points $(2+\sqrt{2}, 2-\sqrt{2})$ and $(3+\sqrt{2}, 3-\sqrt{2})$ with the positive direction of x-axis.

1) $\frac{\pi}{4}$ 2) $\frac{3\pi}{4}$ 3) $\frac{\pi}{2}$ 4) $\frac{\pi}{6}$

4. If the line joining the points $(at_1^2, 2at_1)$ $(at_2^2, 2at_2)$ is parallel to y=x then $t_1+t_2=$

1) $\frac{1}{2}$ 2) 4 3) $\frac{1}{4}$ 4) 2

5. If (3,-1),(2,4),(-5,7) are the mid points of the sides $\overline{BC}, \overline{CA}, \overline{AB}$ of triangle ABC. Then the equation of the side $\overline{CA}$ is

1) 2x+y-8=0 2) x+2y-12=0

3) x+y-6=0 4) x-y+6=0

6. A line passing through the pionts (7,2) (-3,2) then the image of the line in x-axis is

1) y = 4 2) y = 9

3) y = -1 4) y = -2

7. The y-intercept of the line passing through the points (4,7),(1,5) is

1) $\frac{13}{3}$ 2) $\frac{-13}{2}$ 3) $\frac{15}{2}$ 4) 3

8. Area enclosed by the co-ordinate axes and the line passing through the pionts (8,-3) (-4,12) is

1) $\frac{98}{5}$ 2) $\frac{49}{5}$ 3) $\frac{24}{25}$ 4) $\frac{17}{8}$

9. Equation of the line which join the origin and the point of trisection of the portion of the line x+3y-12=0 intercepted between the axes is

1) x=6y 2) x-5y=0

3) 3x-7y=0 4) 2x-5y=0

10. The line 2x+3y+12=0 cuts the axes at A & B. Then the equation of the perpendicular bisector of $\overline{AB}$ is

1) 3x-2y+5=0 2) 3x-2y+7=0

3) 3x-2y+9=0 4) 3x-2y+8=0

11. A(1,-1) B(4,-1) C(4,3) are the vertices of a triangle. Then the equation of the altitude through the vertex 'A' is

1) x=4 2) y=4 3) y+1=0 4)x=1

12. P is the midpoint of the part of the line 3x+y-2=0 intercepted between the axes. Then the image of P in origin is

1) $\left(-1,-\frac{1}{3}\right)$ 2) $\left(-\frac{1}{3},-4\right)$

3) $\left(-\frac{1}{3},-1\right)$ 4) (-2, -3)

13. A straight line meet the axes in A and B such that the centroid of triangle OAB is (a,a). Then the equation of the line AB is

1) x+y=a 2) x-y=3a

3) x+y=2a 4) x+y=3a

14. The two lines y = 2x, y = -2x are

1) Parallel 2) Perpendicular

3) Coincident

4) Equally inclined with the axes

15. If the straight lines y = 4-3x, ay=x+10, 2y+bx+9=0 represents three consecutive sides of a rectangle then the value of ab is

1) 12 2) 6 3) 18 4) 24

16. A, B, C are the points (-1,2),(8,5),(4,9). If D lies on $\overline{AB}$ such that AD : BD = 1:2. Then the equation of the line $\overline{DC}$ is

1) 4x-y+1=0 2) 3x-y=3

3) 2x-y+1=0 4) 3x+y=21

17. The Locus of the foot of the perpendicular from origin to the line which always passes through the fixed point (h, k) is

1) x (x - h) + y (y - k) = 0

2) x (x + h) + y (y + k) = 0

3) x (x + 2h) + y (y + 2k) = 0

4) x (x -2h) + y (y - 2k) = 0

18. A ray of light passing through the point (8,3) and is reflected at (14,0) on x axis. Then the equation of the reflected ray

1) x+y=14 2) x-y=14

3) 2y=x-14 4) 3y=x-14

19. Equation of the line passing through the intersection of the lines 3x-4y+1=0, 5x+y-1=0 and cutting off equal intercepts on the axes is

1) 13(x+y)=11 2) 15(x+y) = 7

3) 23(x+y)=11 4) 13(x+y) = 7

20. A line passing through P(-2,3) meets the axes in A and B. If P divides AB in the ratio of 3:4 then the perpendicular distance from (1,1) to the line is

1) $\frac{9}{\sqrt{5}}$ 2) $\frac{7}{\sqrt{5}}$ 3) $\frac{8}{\sqrt{5}}$ 4) $\frac{6}{\sqrt{5}}$

21. A part of the line intercepted between the axes is bisected at the pont (2,-5). Then the length of the perpendicular from origin to the line is

1) $\frac{20}{\sqrt{19}}$ 2) $\frac{10}{\sqrt{19}}$ 3) $\frac{20}{\sqrt{29}}$ 4) $\frac{10}{\sqrt{29}}$

22. Equation of the line through the point (2,3) and making intercept 2 units between the lines y+2x=3, y+2x=5 is

1) x=2 2) y=3 3) x+y=5 4) x+y=7

23. A straight line is drawn through (3,4) cutting the axes in A and B. If the rectangle OACB is completed then the equation to the locus of C is

1) 3x+4y-xy=0 2) xy-4x-3y=0

3) xy+4x+3y+12=0 4) 7x-4y-xy=0

24. A straight line moves so that the sum of reciprocals of its intercepts on the co-ordinate axes is a constant m. Then the fixed point through which the line passes is

1) (m, m) 2) $\left(\frac{1}{m},\frac{1}{m}\right)$

3) $\left(\frac{1}{m^2},\frac{1}{m^2}\right)$ 4) $\left(\frac{2}{m^2},\frac{2}{m^2}\right)$

25. p is the length of the perpendicular drawn from the origin upon a straight line then the locus of mid point of the portion of the line intercepted between the coordinate axes is

1) $\frac{1}{x^2}+\frac{1}{y^2}=\frac{1}{p^2}$ 2) $\frac{1}{x^2}+\frac{1}{y^2}=\frac{2}{p^2}$

3) $\frac{1}{x^2}+\frac{1}{y^2}=\frac{4}{p^2}$ 4) $\frac{1}{x^2}+\frac{1}{y^2}=\frac{1}{p}$

26. A straight line segment of length “p” moves with its ends on two mutually perpendicular lines. Then the locus of the point which divides the line segment in the ratio 1:2 is

1) $9x^2+36y^2=4p^2$ 2) $9x^2+9y^2=4p^2$

3) $9x^2+36y^2=p^2$ 4) $x^2+4y^2=36p^2$

27. P (α, β) lies on the line y = 6x - 1 and Q (β, α) lies on the line 2x-5y=5. Then the equation of the line PQ is

1) 2x+y=3 2) 3x+2y=5

3) x+y=6 4) 3x+y=7

28. The perpendicular distance from the origin to a line passing through the point ($a\cos^3\theta$, $a\sin^3\theta$) and perpendicular to the line xsecθ+ycosecθ=a is

1) acos2θ 2) asin2θ

3) 2asinθ 4) 2acosθ

29. If (-4,5) is one vertex and 7x-y+8=0 is one diagonal of a square, then the equation of the other diagonal is

1) x+7y-31=0 2) x+7y-15=0

3) x+7y+8=0 4) x+7y-35=0

30. The equations of the sides of a triangle are x-3y=0, 4x+3y=5, 3x+y=0. The line 3x-4y=0 passes through

1) Incentre 2) Centroid

3) Othocentre 4) Circumcentre

31. The parametric equtions of the straight line $\sqrt{3}$ x-y = 4 + 3 $\sqrt{3}$ are

1) $x = -4 + r.\frac{1}{2}$; $y = 3+r.\frac{\sqrt{3}}{2}$

2) $x = 3+r.\frac{1}{2}$; $y = -4 + r.\frac{\sqrt{3}}{2}$

3) $x = 3 + r.\frac{3}{2}$; $y = -4 + r.\frac{1}{2}$

4) $x = 1 + r.\frac{3}{2}$; $y = 3 + r.\frac{1}{2}$

32. The slope of a straight line through A(3,2) is 3/4 then the coordinates of the two points on the line that are 5 units away from A are

1) (-7,5) (1,-1) 2) (7,5) (-1,-1)

3) (6,9) (-2,4) 4) (7,3) (-2,1)

33. The straight line 7x+24y-61=0 intersect the lines x+2y+1=0, x+2y-1=0 in A and B then AB is

1) $\frac{9}{2}$ 2) 7

3) 5 4) 11

34. Perpendicular distance from the origin to the line joining the points (acosθ,asinθ) (acosϕ,asinϕ) is

1) 2a cos (ϕ–θ) 2) $a \cos\left(\frac{\theta-\phi}{2}\right)$

3) $4a \cos\left(\frac{\theta-\phi}{2}\right)$ 4) $a \cos\left(\frac{\theta+\phi}{2}\right)$

35. Two sides of a rectangle are 3x+4y+5-0, 4x-3y+15=0 and its one vertex is (0,0). Then the area of the rectangle is

1) 4 2) 3 3) 2 4) 1

36. One side of an equiateral triangle is 3x+4y=7 and its vertex is (1,2). Then the length of the side of the triangle is

1) $\frac{4\sqrt{3}}{17}$ 2) $\frac{3\sqrt{3}}{16}$ 3) $\frac{8\sqrt{3}}{15}$ 4) $\frac{4\sqrt{3}}{15}$

37. Equation of the line through the point of intersection of the lines 3x+2y+4=0 and 2x+5y-1=0 whose distance from (2,-1) is 2.

1) 2x-y+5=0 2) 4x+3y+5=0

3) x+2=0 4) 3x+y+5=0

38. Equation of the straight line parallel to x+2y-5=0 and at the same distance from (3,2) is

1) x+2y-8=0 2) x+2y+9=0

3) x+2y-9=0 4) x+2y-7=0

39. The In-centre of the triangle formed by the lines y + 1 = 0, 4x - 3y - 7 = 0, 8x - 15y + 49 = 0 is

1) (0, 1) 2) (2, 2) 3) (4, 5) 4) (-6, 7)

40. The vertices of a triangle are A(5,6) B(1, -4) C(-4,0) then the length of the altitutude through the vertex A is

1) $\frac{66}{\sqrt{41}}$ 2) $\frac{55}{\sqrt{41}}$

3) $\frac{17}{5}$ 4) $\frac{19}{5}$

41. Product of the perpendicular distances from the points $\left(\pm\sqrt{p^2-q^2},0\right)$ to the line

$$\frac{x}{p}\cos\theta+\frac{y}{q}\sin\theta=1$$

1) $2q^2$ 2) $\frac{4q^2}{p^2}$ 3) q^2 4) $4q^2$

42. If p, q are the perpendicular distances from the origin to the lines xsecα + ycosecα = a and xcosα – ysinα = acos2α then $4p^2+q^2$ =

1) a^2 2) $4a^2$ 3) $2a^2$ 4) $\frac{a^2}{2}$

43. The equation to the base of an equilateral triangle is $\left(\sqrt{3}+1\right)x+\left(\sqrt{3}-1\right)y+2\sqrt{3}=0$ and opposite vertex is A(1,1) then the Area of the triangle is

1) $3\sqrt{2}$ 2) $3\sqrt{3}$ 3) $2\sqrt{3}$ 4) $4\sqrt{3}$

44. The quadrilateral formed by the lines 2x-5y+7=0, 5x+2y-1=0, 2x-5y+2=0, 5x+2y+3=0 is

1) Rectangle 2) Square
3) Parallelogram 4) Rhombus

45. The quadrilateral formed by the lines 5x-12y+3=0, 12x+5y-3=0, 5x-12y+5=0, 12x+5y+1=0 is

1) Parallelogram 2) Rectangle
3) Square 4) Rhombus

46. The quadrilateral formed by the lines 4x-7y-13=0, 8x-y-39=0, 4x-7y+39=0, 8x-y+13=0

1) Parallelogram 2) Rhombus
3) Rectangle 4) Square

47. The quadrilateral formed by the lines x+8y+37=0, 7x-6y+11=0, x+8y-87=0, 7x-6y-51=0

1) Parallelogram 2) Rectangle
3) Square 4) Rhombus

48. Area of the quadrilateral formed by the lines 2x-5y+7=0, 5x+2y-1=0, 2x-5y+2=0 and 5x+2y+4=0

1) $\frac{25}{29}$ 2) $\frac{3}{4}$ 3) $\frac{2}{7}$ 4) $\frac{7}{16}$

49. Quadrilateral formed by the lines 2x-5y+4=0, 5x-2y+7=0, 2x-5y+3=0, 5x+2y+6=0 is

1) Parallelogram 2) Square
3) Rhombus 4) Trapezium

50. Area of the quadrilateral formed by the lines 4y-3x-a=0, 3y-4x+a=0, 4y-3x-3a=0, 3y-4x+2a=0 is

1) $\frac{a^2}{5}$ 2) $\frac{a^2}{7}$ 3) $\frac{2a^2}{7}$ 4) $\frac{2a^2}{9}$

51. The lines x+2y-3=0, x+2y+7=0, 2x-y-4=0 form the three sides of two squares. Then the equation to the fourth side of one of the square is

1) 2x-y+6=0 2) 2x-y+14=0
3) 2x-y-6=0 4) 2x-y-8=0

52. Equation of the line passing through the point of intersection of the lines 2x+3y-1=0, 3x+4y-6=0 and perpendicular to 5x-2y-7=0 is

1) 2x+5y-19=0 2) 2x+5y+17=0
3) 2x+5y-16=0 4) 2x+5y-22=0

53. Equation of the straight line passing through the point of intersection of the lines 3x+4y-7=0, x-y+2=0 and having slope 3 is

1) 21x-7y+16=0 2) 9x-3y+14=0
3) 21x-7y+12=0 4) 9x-3y+5=0

54. A quadrilateral is formed by the lines x=0, y=0, x+y=1, 6x+y=3, then the equation of the diagonal of the quadrilateral passing through origin.

1) 5x-2y=0 2) 3x-4y=0
3) 3x-2y=0 4) 5x-7y=0

55. The perpendicular distance from the point of intersection of the lines 3x+2y+4=0, 2x+5y-1=0 to the line 7x+24y-15=0

1) $\frac{2}{3}$ 2) $\frac{1}{7}$ 3) $\frac{1}{5}$ 4) $\frac{2}{5}$

56. Area of the triangle formed by the lines x=0, x+y=2, x-y=1/2 is

1) $\frac{25}{16}$ 2) $\frac{15}{8}$ 3) $\frac{3}{4}$ 4) $\frac{3}{8}$

57. A triangle is formed by the lines $U \equiv 2x+y-3=0$, $V \equiv x-y=0$, $W \equiv x-2=0$ if U+kV=0 passes through the orthocentre of the triangle then the value of k is

1) 2 2) -2 3) 1 4) 2/3

58. The three lines 4x-7y+10=0, x+y=5, 7x+4y-15=0 form the sides of a triangle. Then the point (1,2) is

1) Centroid of the triangle
2) In-centre of the triangle
3) Orthocentre of the triangle
4) Circumcentre of the triangle

59. Two vertices of a triangle are (4,-3) and (-2,5), if the orthocentre of the triangle is (1,2) then its third vertex is

1) (3, 8) 2) (-3,-1) 3) (2,-5) 4) (33,26)

60. Circum centre of the triangle formed by the lines y=x, y=2x, y=3x+4 is

1) (6, -8) 2) (6, 8) 3) (-6, 8) 4) (5, 7)

61. If the lines 3x+2y-5=0, 2x-5y+3=0, 5x+by+c=0 are concurrent then b+c =

1) 7 2) -5 3) 6 4) 9

62. Equation of the line through the intersection of the lines 4x-3y-1=0, 2x-5y+3=0 and equally inclined with the axes is

1) x+y-2=0 2) x-y+3=0

3) x+y-7=0 4) x-y+5=0

63. A triangle formed by the lines 3x+4y=12, x=0, y=0 then the excentre of the triangle opposite to the vertex (4,0) is

1) (-2, 2) 2) (-3, 2) 3) (-3, 1) 4) (-5, 1)

64. An equilateral triangle has its centroid at origin and one side is x+y-1=0 then the vertex of the triangle not on the given side is

1) (1, 1) 2) (-1, -1) 3) (2, 2) 4) (-2, -2)

65. If the lines 2x-ay+1=0, 3x-by+1=0, 4x-cy+1=0 are concurrent then a,b,c are in

1) G.P. 2) A.P. 3) H.P. 4) A.G.P.

66. One vertex of a square ABCD is A(-1, 1) and the equation of one diagonal BD is 3x+y-8=0 then C =

1) (-5, 3) 2) (5, 3) 3) (-5, -3) 4) (2, 5)

67. Point B is symmetric to A (7, 3) with respect to the bisector of second quadrant, then AB is

1) $2\sqrt{10}$ 2) $\sqrt{10}$

3) $5\sqrt{3}$ 4) $10\sqrt{2}$

68. Image of $(x+2)^2+(y-3)^2 = 25$ w.r.t. y=x is

1) $(x-3)^2 + (y-2)^2 = 25$

2) $(x-3)^2 + (y+2)^2 = 25$

3) $(x+2)^2 + (y+3)^2 = 25$

4) $(x-2)^2 + (y-3)^2 = 25$

69. The foot of the perpendiculars from origin to the lines x+y-4=0, x+5y-26=0 lie on

1) 2x+y-6=0 2) x+2y-11=0

3) 3x+y-8=0 4) 4x+5y-9=0

70. The equation of the perpendicular bisector of AB is x+5y-20=0 if A = (2,1) then B is

1) (3, 6) 2) (4, 7) 3) (5, 3) 4) (4,6)

71. If (2, -3) is the foot of the perpendicular from (-4, 5) on a line then its equation is

1) 3x-4y+28=0 2) 3x-4y-18=0

3) 3x-4y+18=0 4) 3x-4y-17=0

72. The angle between the lines kx+y+9=0, y-3x=4 is 45° then the value of k is

1) 2 or ½ 2) 2 or -1/2

3) -2 of ½ 4) -2 or -1/2

73. The triangle formed by the lines x-7y-22=0, 3x+4y+9=0, 7x+y-54=0 is

1) Right angled triangle

2) Right angled isosceles

3) Equilateral 4) Isosceles

74. The triangle formed by the lines x+y=0, 3x+y-4=0, x+3y-4=0 is

1) Isoceles 2) Right angled

3) Equilateral 4) Scalane

75. The triangle formed by the lines 5x-2y+10=0, 5x+2y-10=0, y=10 is

1) Right angled 2) Isosceles

3) Right angled isosceles 4) equilateral

76. The triangle formed by the lines $\sqrt{3}x + y - 2 = 0$, $\sqrt{3}x - y + 1 = 0$, y=0 is

1) Equilateral 2) Right angled

3) Right angled isosceles

4) Isosceles

77. The pair of lines through the origin formed with the line 2x+3y=6 is an isosceles right angled triangle are

1) x-5y=0, 5x+y=0 2) 2x-y=0, x+2y=0

3) 3x-y=0, x+3y=0 4) 4x-y=0, x+4y=0

78. The diagonal of a square is 8x-15y=0 and one vertex of the square is (1, 2) then the equations to the sides of the square passing through this vertex are

1) 3x+y=5, x-3y+5=0

2) 23x-7y=9, 7x+23y=53

3) 4x+3y=10, 3x-4y+5=0

4) 7x-y=5, x+7y=15

79. 7x-y+3=0, x+y-3=0 are two equal sides of an isosceles triangle and the third side passes through (1,0) then the equation to the third side is

1) 3x+y+3=0 2) x-3y-1=0

3) x-y+1=0 4) x+2y-4=0

80. Slope of the line equally inclined to the lines 3x=4y+7 and 5y=12x+6 is

1) $\frac{3}{5}$ 2) $\frac{9}{7}$ 3) $\frac{7}{9}$ 4) $\frac{5}{3}$

81. Equation of the line equidistant from the lines 2x+y+4=0, 3x+6y-5=0 is

1) 3x-3y+17=0 2) 5x+7y-5=0

3) 3x-3y+19=0 4) 9x-9y+17=0

82. The acute angle bisector between the lines 3x-4y-5=0, 5x+12y-26=0 is

1) 7x-56y+32=0 2) 9x-3y+13=0

3) 14x-112y+65=0 4) 7x-13y+9=0

83. The obtuse angle bisector between the lines 2x-y-4=0, x-2y+10=0 is

1) x-y+7=0 2) 3x-y+5=0

3) x+y-14=0 4) 2x+3y-5=0

84. The line 3x-3y+17=0 bisects the angle between a pair of lines of which one line is 2x+y+4=0, then the equation to the other line is

1) 3x+6y-5=0 2) 3x+6y-7=0

3) 7x-y+14=0 4) 4x-y+3=0

85. ABC is an isosceles triangle if the co-ordinates of the base are B(1,3) and C(-2,7) then the coordinates of the vertex A can be

1) (1, 6) 2) (-1/2, 5)

3) (5/6, 6) 4) (-7, 1/8)

86. A variable line is at a constant distance p from the origin and meets the co-ordinates axes in A and B, then the locus of centroid of triangle OAB is

1) $x^{-2} + y^{-2} = 3p^{-2}$ 2) $x^{-2} + y^{-2} = 9p^{-2}$

3) $x^{-2} + y^{-2} = 6p^{-2}$ 4) $x^{-2} + y^{-2} = p^{-2}$

87. A variable line x/a + y/b = 1 is such that a+b = 10. Then the locus of midpoint of the portion of the line intercepted between the axes is

1) x+y=0 2) 10x+5y=1

3) x+y=5 4) 5x+10y=1

88. If the algebraic sum of the perpendicular distances from the points (3,0) (0,3) (0,0) to a variable line is zero, then the line passes through

1) (1, 1) 2) (3, 1) 3) (1, 3) 4) (-1, 1)

89. The equation of the line passing through the point of intersection of the lines 2x+y=5 and y=3x-5 and which is at the minimum distance from the point (1,2) is

1) x+y=3 2) x-y=1

3) x-2y=0 4) 2x+5y=7

90. The equation of set of lines which are at a constant distance 2 units from the origin is

1) x+y+2=0 2) x+y+4=0

3) $x\cos\alpha + y\sin\alpha = 2$

4) $x\cos\alpha + y\sin\alpha = ½$

91. The lines (a+b)x+(a-b) y – 2ab = 0, (a-b)x + (a+b) y – 2ab = 0 and x+y=0 from an isosceles triangle whose vertical angle is

1) $\frac{\pi}{2}$ 2) $\tan^{-1}\left(\frac{2ab}{a^2-b^2}\right)$

3) $\tan^{-1}\left(\frac{a}{b}\right)$ 4) $2\tan^{-1}\left(\frac{a}{b}\right)$

92. The foot of the perpendicular drawn from (0, 0) to the line $x\cos\alpha + y\sin\alpha - p = 0$ is

1) $(p\sin\alpha, p\cos\alpha)$

2) $(p\sec\alpha, p\cos\alpha)$

3) $(p\cos\alpha, p\sin\alpha)$

4) (p, p)

93. All points lying inside the triangle formed by the points (1, 3), (5, 0), (-1, 2) satisfy

1) $2x+y-13 \geq 0$ 2) $3x+2y \geq 0$

3) $3x-4y-12 \leq 0$ 4) $4x+y = 0$

94. The total number of circles that can be drawn touching all the three lines x+y-1=0, x-y-1=0, y+1=0 is

1) 1 2) 2 3) 3 4) 4

95. p_1, p_2 are lengths of the perpendiculars from any point on 2x+11y=5 upon the lines 24x+7y=20, 4x-3y=2 then p_1 =

1) p_2 2) $2p_2$ 3) $\frac{1}{2}P_2$ 4) $\frac{1}{3}P_2$

96. In an isosceles triangle OAB, O is the origin and OA = BC = 6. The equation of the side AB is x-y+1=0. Then the area of the triangle is

1) $2\sqrt{21}$ 2) $\sqrt{142}$ 3) $\frac{\sqrt{142}}{2}$ 4) $\frac{\sqrt{71}}{2}$

97. A line passing through (3,4) meets the axes OX and OY at A and B respectively. The maximum area of the triangle OAB in square units is

1) 8.5 2) 16.5 3) 24.5 4) 32.5

98. The number of lines that can be drawn through the point (5, 2) at a distance of 5 units from the point (2, -2) is

1) 0 2) 1 3) 2 4) ∞

99. 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 is

1) 9x-7y=1 2) 9x+7y=1
3) 7x-9y=1 4) 7x-9y=17

100. Area of triangle formed by angle bisectors of coordinate axes and the line x=6 in sq.units is

1) 36 2) 18 3) 72 4) 9

101. The distance between two parallel lines is p^1-p. Equation of one line is $x\cos\alpha + y\sin\alpha = p$ then the equation of the 2nd line is

1) $x\cos\alpha + y\sin\alpha + p^1 + 2p = 0$
2) $x\cos\alpha + y\sin\alpha = 2p^1 - p$
3) $x\cos\alpha + y\sin\alpha = 0$
4) $x\cos\alpha + y\sin\alpha + p^1 - 2p = 0$

102. Number of straight lines passing through (1, 3) (7, -3) (5, -1) (6, -2) is

1) 2 2) $4c_2$ 3) $4p_2$ 4) $4c_4$

103. The point (2,3) is reflected four times about co-ordinate axes continuously starting with x-axis. The area of quadrilateral formed in sq.units is

1) 24 2) 6 3) 12 4) 5

104. If triangle formed by the points A (2,4) B(2,6) C($2+\sqrt{3}$,5) the equation of the internal bisector of C is

1) x+y=2 2) x=0
3) y=5 4) x+y=1

105. If 2(sina + sinb) x – 2sin (a – b) y = 3 and 2 (cosa + cos b) x + 2cos (a-b) y = 5 are perpendicular then sin2a + sin 2b =

1) sin (a-b) – 2sin (a+b)
2) sin 2(a-b) – 2sin (a+b)
3) 2sin (a-b) – sin (a+b)
4) sin2 (a-b) – sin (a+b)

106. One diagonal of a square is the portion of the line 7x+5y=35 intercepted by axes one end of other diagonal

1) (-1, 1) 2) (6, 5)
3) (7, 9) 4) (11, 13)

107. The point of intersection of diagonals of the parallelogram formed by the lines 3x-2y+5=0, x+3y-5=0, 3x-2y+11=0 and x+3y+3=0 is

1) (-2, -1) 2) (-2, 1) 3) (2, -1) 4) (2, 1)

108. A particle is moving in a straight line and at some moment it occupied the positions (5, 2) and (-1, -2) then the position of the particle when it is on the x-axis is

1) (-2, 0) 2) (0, 2) 3) (2, 0) 4) (4, 0)

109. The sum of the abscissa of all the points on the line x+y=4 that lie at a unit distance from the line 4x+3y-10 =0 is

1) 4 2) -4 3) 3 4) -3

110. Each side of a square is of length 4. The centre of the square is (3, 7) and one of its diagonals is parallel to y=x. Then co-ordinates of its vertices are

1) (1,5), (1,9), (5,9), (5,5)
2) (2,5), (2,7), (4,7), (4,4)
3) (2,5), (2,6), (3,5), (3,6)
4) (5,2), (6,2), (5,3), (6,3)

111. If a line AB makes an angle α with OX and is at a distance of p units from the origin then the equation of AB is

1) $x\sin\alpha - y\cos\alpha = p$

2) $x\cos\alpha + y\sin\alpha = p$

3) $x\sin\alpha + y\cos\alpha = p$

4) $x\cos\alpha - y\sin\alpha = p$

112. If the lines x+py+p=0, qx+y+q=0 and rx+ry+1=0 (p,q,r being distinct and $\neq 1$) are concurrent, then the value of $\frac{p}{p-1}+\frac{q}{q-1}+\frac{r}{r-1}$ =

1)1 2) -1 3) 2 4) -2

113. The equation of the line passing through the point of intersection of the lines 2x+y=5, 3x-y=5 and which is at the minimum distance from the point (1,2) is

1) x+y=3 2) x-y=1 3) x-2y=0 4) x-y=3

114. The vertices of a triangle are A(-1,-7), B(5,1) and C(1,4). The equation of the bisector of $\angle ABC$ is

1) x+7y+2=0 2) x+7y-2=0

3) x-7y-2=0 4) x-7y+2=0

115. The point A(2,1) is translated parallel to the line x-y=3 by a distance of 4 units. If the new position A_1 is in 3rd quadrant, then coordinates A_1 are

1) $\left(\sqrt{2}-2,-1-\sqrt{2}\right)$ 2. $\left(2-2\sqrt{2},1-2\sqrt{2}\right)$

3) $\left(\sqrt{2}-2,1+2\sqrt{2}\right)$ 4. $\left(2-2\sqrt{2},1-\sqrt{2}\right)$

116. S_1, S_2 are the inscribed and circumscribed circles of a triangle with sides 3,4,5. Then area of S_1 / area of S_2 = _______

1) 16/25 2) 4/25 3) 9/25 4) 91/6

117. Two sides of a Rhombus ABCD are parallel to the lines x-y=5 and 7x-y=3. The diagonals intersect at (2,1) then the equations of the diagonals are

1) x-y=1, 7x-y=13

2) x+y=3,x+7y=9

3) x+2y=4, 2x-y=3

4) 3x+4y=10, 4x-3y=5

118. The equation of the bisector of the angle between the lines x-7y+5=0, 5x+5y-3=0 which is the supplement of the angle containing the origin will be

1) x+3y-2=0 2) x-3y+2=0

3) 3x-y+1=0 4) 3x+y+2=0

119. A line joining A(2,0) and B(3,1) is rotated about A in anticlock-wise direction though 15°, then the equation of the line AB in new position is given by

1) y= $\sqrt{3}$ x-2 2) y = $\sqrt{3}$ (x-2)

3) y = $\sqrt{3}$ (x+2) 4) x-2 = $\sqrt{3}$ y

120. The abscissa of the orthocentre of the triangle formed by the lines $y=m_i x+\frac{1}{mi}$ (i=1,2,3) is

1) 1 2) -1 3) 2 4) -2

121. The orthocentre of the triangle formed by the lines x+y=1, 2x+3y=6 and 4x-y+9=0 lies in quadrant number

1) 1st 2) IInd 3) IIIrd 4) IVth

122. Equation of a diameter of the circum circle of the triangle formed by the lines 3x+4y-7=0, 3x-y+5=0 and 8x-6y+1=0 is

1) 3x-y-5=0 2) 3x+y+5=0

3) 3x-y+5=0 4) 3x+y-5=0

123. One side of a rectangle lies along the line 4x+7y+5=0. Two vertices are (-3,1), (1,1) then the remaining vertices are

1) $\left(\frac{1}{65},\frac{-47}{65}\right),\left(\frac{-131}{65},\frac{177}{65}\right)$

2) $\left(\frac{-1}{65},\frac{47}{65}\right)\left(\frac{-131}{65},\frac{177}{65}\right)$

3) $\left(\frac{1}{65},\frac{-47}{65}\right)\left(\frac{131}{65},\frac{-177}{65}\right)$

4) (1, -47), (131, 47)

124. The reflection of y= $\sqrt{x}$ w.r.t. y-axis is

1) y = - $\sqrt{x}$ 2) y = $\sqrt{-x}$

3) y = - $\sqrt{-x}$ 4) x = $\sqrt{y}$

125. The equation of a st.line passing through the point (-10,4) and making angle $Tan^{-1}2$ with 2y = x - 10 are

1) 3x-y=2 2) x-10=0

3) 3x+2y=14 4) 2x-y+24=0

126. One of the lines passing through (-2,-7) and having an intercept of length 3 between the two lines 4x+3y=12 and 4x+3y=3 is given by

1) x+2=0 2) x-2=0

3) y+7=0 4) y-7 =0

KEY

1) 4	2) 3	3) 1	4) 4	5) 3
6) 4	7) 1	8) 1	9) 1	10) 1
11) 3	12) 3	13) 4	14) 4	15) 3
16) 2	17) 1	18) 3	19) 3	20) 3
21) 3	22) 1	23) 2	24) 2	25) 3
26) 1	27) 3	28) 1	29) 1	30) 3
31) 2	32) 2	33) 3	34) 2	35) 2
36) 3	37) 2	38) 3	39) 1	40) 1
41) 3	42) 1	43) 3	44) 1	45) 2
46) 2	47) 1	48) 1	49) 4	50) 3
51) 1	52) 2	53) 1	54) 3	55) 3
56) 1	57) 2	58) 3	59) 4	60) 1
61) 2	62) 1	63) 1	64) 2	65) 2
66) 2	67) 4	68) 2	69) 3	70) 1
71) 2	72) 2	73) 2	74) 1	75) 2
76) 1	77) 1	78) 2	79) 2	80) 2
81) 1	82) 3	83) 3	84) 1	85) 4
86) 2	87) 3	88) 1	89) 1	90) 3
91) 2	92) 3	93) 2	94) 4	95) 1
96) 4	97) 3	98) 2	99) 1	100) 1
101) 4	102) 4	103) 1	104) 3	105) 2
106) 1	107)2	108) 3	109) 2	110) 1
111) 1	112) 1	113) 1	114) 4	115) 2
116) 2	117) 3	118) 1	119) 2	120) 2
121) 2	122) 3	123) 3	124) 2	126) 2

HINTS

4. Slope of the line join of $(at_1^2, 2at_1)$ $(at_2^2\ 2at_2)$ is 1.

5. Verification

7. Write the line join of (4, 7) and (1, 5) then y-intercept.

8. Area of triangle is ½ la. bl where a is x – intercept and b is y – intercept.

9. Lines joining origin to the trisection points of a line.

10. Verify with the midpoint of AB.

12. Mid point of the given line is P(1/3, 1) then the image of (1/3, 1) with respect to origin.

13. $\frac{x}{a}+\frac{y}{b}=3$

16. Find the point which divides AB in the ratio 1:2 then verify answer.

17. Verify the point (h, k) on which option it lies.

18. Write the image of (8, 3) in x-axis and write the equation through that point and (14,0).

21. Find the distance from origin to the line $\frac{x}{x_1}+\frac{y}{y_1}=2$

23. The points A, P, B are collinear.

24. $\frac{1}{a}+\frac{1}{b}=k \Rightarrow \left(\frac{1/k}{a}\right)+\left(\frac{1/k}{b}\right)=1$

25. Equate the distance from (0, 0) to the line $\frac{x}{x_1}+\frac{y}{y_1}=2$ to P.

27. $\beta = 6\alpha - 1$. $2\alpha - 5\beta = 5$ solve then get α and β.

29. Write the equation to a line perpendicular to 7x-y+8=0 and substitute (-4, 5)

30. Given lines form right angled triangle.

32. $x = x_1 + r\cos\theta$, $y = y_1 + \sin\theta$, $\tan\theta = ¾$, $(x_1, y_1) = (3, 2)$, r = 5.

35. The perpendicular distances from origin to the lilnes are a, b then its area is ‘ab’ square units.

36. Apply $a = \frac{2h}{\sqrt{3}}$, h is height, a side of the triangle.

39. Incentre is equidistant from sides.

43. Area of an equiletaral triangle is $\frac{h^2}{\sqrt{3}}$, h is height of the triangle.

44. Verify the angle between adjacent sides and distance between the opposite sides.

50. Area of the quadrilateral $= \left|\frac{(c_1 - c_2)(d_1 - d_2)}{a_1 b_2 - a_2 b_1}\right|$

51. Verification

54. The point of intersection of x+y=1 &6x+y=3 and joining the origin is required line.

57. Substitute orthocenter of the triangle in U+KV=0

58. Given lines form right angled triangle.

59. Substitute, the options in the equation $(x-x_1)(x_2-x_3) + (y-y_1)(y_2-y_3) = 0$ where (x_1, y_1) and (x_2, y_2) are the two vertices and (x_3, y_3) is the orthocenter.

60. Verification with SA = SB = SC

61. Solving first two lines and substituting the point in 3rd equation.

62. Taking $L_1 + \lambda L_2 = 0$ then coefficient of x = coefficient of y.

64. Verify 3rd vertex lie on y=x and the distance from the origin to that vertex is $\sqrt{2}$

65. Apply $\begin{vmatrix} 2 & -a & 1 \\ 3 & -b & 1 \\ 4 & -c & 1 \end{vmatrix} = 0$

66. Image of A with respect to diagonal BD.

67. B is image of A with respect to x+y=0

68. Image of (-2, 3) with respect to y=x.

70. B is the image of A with respect to x+5y-20=0

73. Verification

77. Verification

79. Verification of the angle

80. Write the angular bisector of the given lines.

81. The angle bisector of the olines 2x+y+4=0, 3x+6y-5=0 is required line.

82. Use $\frac{a_1 x + b_1 y + c_1}{\sqrt{a_1^2 + b_1^2}} = \pm \frac{a_2 x + b_2 y + c_2}{\sqrt{a_2^2 + b_2^2}}$

84. Verify with angle bisector formula.

86. Equation of the line AB is $\frac{x}{x_1} + \frac{y}{y_1} = 3$, perpendicular distance from (0, 0) to the line is p.

87. Mid point of the line segment (a/2, b/2) = (x_1, y_1)

89. Point (1, 2) lies on $L_1 + \lambda L_2 = 0$

90. Verification

92. Apply foot of the perpendicular formula.

93. Verification

94. Given lines forms a triangle.

95. Take a point (5/2, 0) on the line 2x+11y=5 and verify the options.

97. If the intercept are equal, then the area of triangle is maximum.

98. Distance between the points (2, -2) & (5, 2) is 5 units.

100. Equations of the angular bisectors of the axes.

101. Verify the distance between the parallel lines.

102. Given points are collinear.

103. $(2x_1)(2y_1)$

104. Triangle formed by them is equilateral triangle so internal bisector passes through C and mid point of A & B.

105. $m_1 m_2 = -1$

106. Take perpendicular bisector of portion between the axes, verify the options.

108. Line passing through given points is $2x-3y=4 \Rightarrow \frac{x}{2}+\frac{y}{-4/3}=1$

109. $x+y=4 \Rightarrow y = 4-x$

$$\text{distance} = \left|\frac{4x+3y-10}{5}\right| = 1$$

$$= \left|\frac{4(x)+3(4-x)-10-10}{5}\right| = 1$$

$\Rightarrow x = 3$ or -7

110. Use $(x_1 \pm r\cos\theta, y_1 \pm r\sin\theta)$ where $r = 2\sqrt{2}; \theta = 45^{O}, 135^{O}$

111. Slope = $\tan\alpha$ equation is $x\sin\alpha + y\cos\alpha + k = 0$ and distance from origin is p.

LEVEL – III

1. The lne $3x-2y = 24$ meets x-axis at A and y-axis at B. The perpendicular bisector of AB meets the line through (0, -1) and parallel to x-axis at C. Then C is

1) $\left(\frac{-7}{2},-1\right)$ 2) $\left(\frac{-15}{2},-1\right)$

3) $\left(\frac{-11}{2},-1\right)$ 4) $\left(\frac{-13}{2},-1\right)$

2. Area of the triangle formed by the lines $7x+3y=35$, $x=5$, $2y-3=0$ is

1) $\frac{27}{28}$ 2) $\frac{17}{28}$

3) $\frac{13}{25}$ 4) $\frac{27}{56}$

3. Area of the triangle formed by the lines $7x-2y+10=0$, $7x+2y-10=0$, $y+2=0$ is

1) 7 2) 14

3) 18 4) 12

4. In triangle ABC the equations of the sides $\overline{AB}, \overline{AC}$ are $2x+3y=29$, $x+2y=16$. If the mid point of $\overline{BC}$ is (5,6) then the equation of the side $\overline{BC}$ is

1) $x+y+11=0$ 2) $2x+y-16=0$

3) $x-y+1=0$ 4) $2x-y-4=0$

5. A straight line drawn through the point of intersection of the lines $\frac{x}{p}+\frac{y}{q}=1$, $\frac{x}{q}+\frac{y}{p}=1$ meets coordinates axes in A and B. Then the locus of midpoint of AB is

1) $4(p+q)xy = pq(x+y)$

2) $2(p+q)xy = pq(x+y)$

3) $(p+q)xy = 2pq(x+y)$

4) $(p+q)xy = 4pq(x+y)$

6. Ortho centre of the triangle formed by the lines $3x-2y-6=0$, $3x+4y+12=0$, $3x-8y+12=0$

1) $\left(\frac{-1}{6},\frac{-23}{9}\right)$ 2) $\left(\frac{-1}{7},\frac{-1}{8}\right)$

3) $\left(\frac{-1}{7},\frac{1}{8}\right)$ 4) $\left(\frac{2}{3},\frac{7}{9}\right)$

7. Orthocentre of the triangle formed by the lines $x-2y+9=0$, $x+y-9=0$, $2x-y-9=0$ is

1) (7, 2) 2) (6, 6) 3) (1, 2) 4) (5, 5)

8. Circum centre of the triangle formed by the lines $x+y=0$, $2x+y+5=0$, $x-y=2$ is

1) (-2, -1) 2) (-3, 1) 3) (-4, 3) 4) (-1, -3)

9. Centroid of the triangle formed by the lines $x+2y-5=0$, $2x+y-7=0$, $x-y+1=0$ is

1) (1, 3) 2) (3, 5) 3) (2, 2) 4) (1, 1)

10. For all values of θ all the lines represented by the equation $(2\cos\theta + 3\sin\theta)x + (3\cos\theta - 5\sin\theta) - y - (5\cos\theta - 2\sin\theta) = 0$ passes through a fixed opint then the reflection of that point with respect to the line $x+y = \sqrt{2}$ is

1) $\left(\sqrt{2}+1,\sqrt{2}+1\right)$ 2) $\left(\sqrt{2}-1,\sqrt{2}-1\right)$

3) $\left(\sqrt{3}-1,\sqrt{3}-1\right)$ 4) $\left(\sqrt{3}+1,\sqrt{3}+1\right)$

11. One vertex of an equilateral triangle is (2,3) and the equation of one side is x-y+5=0 then the equations to the other sides are

1) y-3 = $-\left(2\pm\sqrt{3}\right)$ (x-2)

2) y-3 = $\left(\sqrt{2}\pm 1\right)$ (x-2)

3) y-3 = $\left(\sqrt{3}\pm 1\right)$ (x-2)

4) y-3 = $\left(\sqrt{5}\pm 1\right)$ (x-2)

12. The vertices of triangle OBC are O (0,0) B(-3,-1) C(-1, -3) then the equation of the line parallel to the side BC and cutting the sides OB & OC at a distance 1/2 from the origin is

1) $x+y-1/\sqrt{2} = 0$

2) $x+y+1/\sqrt{2} = 0$

3) x+y-1/2 = 0

4) x+y+1/2= 0

13. The equation of the line which passes through the point of intersection of the lines x+2y+2=0 and 2x+5y+3=0 and which is at the maximum distance from the piont (-2,-3) is

1) 2x+y+7=0 2) x-2y+6=0

3) x+3y+1=0 4) 2x-y+3=0

14. In an isosceles triangle, the ends of the base are (2a, 0) and (0, a) and one side is parallel to y-axis. The third vertex is

1) $\left(2a\ \frac{5a}{2}\right)$ 2) $\left(\frac{5a}{4}, a\right)$

3) (2a, a) 4) (4a, a)

15. The equation of a straight line L is x+y=2, and L_1 is another straight line perpendicular to L and passes through the piont (1/2, 0), then area of the triangle formed by the y-axis and the lines L, L_1 is

1) $\frac{25}{8}$ 2) $\frac{25}{16}$

3) $\frac{25}{4}$ 4) $\frac{25}{12}$

16. A = (a_1, b_1), B=(a_2, b_2). If every point on the line (a_1-a_2) x + (b_1-b_2) y = c is equidistant from A and B. Then c =

1) $\frac{a_1^2+b_1^2-a_2^2-b_2^2}{2}$

2) $\frac{a_1^2+a_2^2-b_1^2-b_2^2}{2}$

3) $\frac{a_1^2+a_2^2+\left(b_1^2+b_2^2\right)}{2}$

4) $\frac{b_1^2-a_1^2-b_2^2-a_2^2}{2}$

17. Two sides of a triangle are $y = m_1x$ and $y=m_2x$. m_1, m_2 are the roots of the equation $x^2+ax-1=0$. For all values of a, the orthocentre of the triangle lies at

1) (1, 1) 2) (2, 2) 3) $\left(\frac{3}{2}, \frac{3}{2}\right)$ 4) (0,0)

18. The straight lines x+2y-9=0, 3x+5y-5=0 and ax+by-1 are concurrent if the straight line 22x-35y-1=0 passes through the point

1) (a, b) 2) (b,a) 3) (-a,b) 4) (-a, -b)

19. $\frac{x}{a}+\frac{y}{b}=1$ is a variable line where $\frac{1}{a^2}+\frac{1}{b^2}=\frac{1}{c^2}$ (c-constant) locus of the foot of the perpendicular drawn from origin is

1) $x^2+y^2 = c^2$ 2) $x^2+y^2 = 2c^2$

3) $x^2+y^2 = \frac{c^2}{2}$ 4) $x^2+y^2 = \frac{1}{c^2}$

20. The lines 2x+3y=6, 2x+3y=8 cut the x-axis at A, B a line *l* is drawn through (2,2) meets x-axis at C such that abscissa of A, B and C are in A.P. Then the equation of line is

1) 2x+3y=10 2) 3x+2y=10

3) 2x-3y=10 4) 3x-2y=10

21. If $(2a-3, a^2-1)$ is on the same side of the line x+y-4=0 as that of origin then the set of values of 'a' is

1) (-4, 2) 2) (-2,4) 3) (-7,8) 4) (-7,5)

22. If the lines x+ay+a=0, bx+y+b=0, cx+cy+1=0 (a, b, c being distinct and $\neq 1$) are concurrent then the value of $\frac{a}{a-1}+\frac{b}{b-1}+\frac{c}{c-1}=$

1) -1 2) 0 3) 1 4) 3

23. Origin is the centre of the square with one of its vertices at (3,4) then the other vertices are

1) (-3, 4), (-3, -4), (3, -4)
2) (-4, 3), (-3, -4), (4, -3)
3) (-4, 3), (-4, -3), (3, -4)
4) (3, 4), (-4, -3), (4, -3)

24. The base of an Isosceles triangle is of length "2a" and length of the altitude dropped to the base is "h" then the distance from the mid point of base to the side of a triangle is

1) $\frac{ah}{h^2+a^2}$ 2) $\frac{ah}{\sqrt{h^2+a^2}}$

3) $\frac{h}{\sqrt{h^2+a^2}}$ 4) $\frac{\sqrt{h^2+a^2}}{ah}$

KEY

1) 4	2) 4	3) 2	4) 1	5) 2
6) 1	7) 4	8) 2	9) 3	10) 2
11) 1	12) 2	13) 1	14) 1	15) 2
16) 1	17) 4	18) 2	19) 1	20) 1
21) 1	22) 3	23) 2	24) 2	

LEVEL - IV

NEW PATTERN QUESTIONS

1. Observe the following lists w.r.t inclinations of lines

List I	List - II
A) Vertical line	1) 60^0
B) line bisecting angle between coordinate axes	2) 75^0
C) line with slope $\sqrt{3}$	3) 0^0
D) horizontal line	4) $\frac{\pi}{2}$
	5) $\frac{\pi}{4}$ or $\frac{3\pi}{4}$

Then the correct answer is

	A	B	C	D
1)	2	4	1	3
2)	4	3	2	1
3)	4	5	1	3
4)	4	5	3	1

2. Observe the following lists with respect to slopes of the lines

List I	List II
A) 33x-3y-38=0	1) $\frac{-2}{3}$
B) 4x-y-2=0	2) 4
C) 2x+3y-6=0	3) $-2/13$
D) 2x+25y=1	4) 11
	5) $-2/25$

Then the correct answer is

	A	B	C	D
1)	1	2	3	3
2)	4	2	1	5
3)	2	4	5	3
4)	2	4	3	1

3. Observe the following lists with respet to areas of triangle formed by the lines with coordinate axes in Sq.units

List I	List II
A) x+y=10 $\sqrt{2}$	1) $\sqrt{3}/2$
B) 2x-3y-6=0	2) $2/\sqrt{3}$
C) $\sqrt{3}$ x+y-12=0	3) 6
D) 3x-4y-12=0	4) 100
	5) 3

Then the correct answer is

	A	B	C	D
1)	4	2	1	5
2)	4	3	2	5
3)	4	5	2	3
4)	1	2	3	4

4. Observe the following lists with respect to distance of the line from origin

List I	List II
A) x-2y+1=0	1) $7/\sqrt{10}$
B) $x+\sqrt{3}y+2=0$	2) $4/\sqrt{5}$
C) 3x-y+7=0	3) $1/\sqrt{5}$
D) 2x-y-4=0	4) 1
	5) $7/\sqrt{10}$

Then the correct answer is

	A	B	C	D
1)	3	4	1	2
2)	1	2	3	4
3)	2	1	3	4
4)	5	3	4	1

5. Observe the following list with respect to the line ax+by+c=0

List I	List II
A)Perpendicular distance from (0,0)	1) $-c/b$
B) X-intercept of the line	2) $\left(\frac{-c}{a},\frac{-c}{b}\right)$
C) Y-intercept of the line	3) $\frac{\lvert c \rvert}{\lvert a^2+b^2 \rvert}$
D) Circumcentre of triangle OAB	4) $\left[\frac{-c}{2a},\frac{-c}{2b}\right]$
	5) $-c/a$

Then the correct answer is

	A	B	C	D
1)	3	5	1	2
2)	3	5	1	4
3)	3	4	1	5
4)	1	2	3	4

6. Write the distance in ascending order from O(0,0) to A(1,1) B(3,4) C(2,1)

1) A, B,C   2) A, C,B
3) B,C,A   4) B,A,C

7. The arrangement of the following straight lines in ascending order of their slopes

A) $2y=\sqrt{3}x$ B) y=2
C) y = x   D) y = -x
1) A,B,C,D,   2) D,B,A,C
3) B,C,D,A   4) D,A,B,C

8. The arrangement of the following straight lines with descending order of their perpendicular distance from origin

A) 3x+4y+15=0   B) y=3x
C) y=2   D) x+y+1=0
1) A,B,C,D,   2) A,C,D,B
3) A,C,B,D   4) A,D,B,C

9. Write the ascending order of areas of the triangle formed with coordinate axes and the following lines

A) x+y+3=0   B) x+y+1 =0
C) 2x+y-6=0   D) 4x+3y-12=0
1) A,B,C,D,   2) B,A,C,D
3) C,A,B,D,   4) D,C,A,B

10. Write the ascending order of the distance between the parallel lines

A) 2x+3y+1=0; 2x+3y+14=0
B) 3x+4y+10=0, 3x+4y+5=0
C) x+y+1=0, x+y+3=0
D) 2x+y+1=0, 2x+y+6=0
1) B,C,D,A   2) A,B,C,D,
3) B,D,C,A,   4) B,C,A,D

11. Write the descending order of the perpendicular distance of the line 2x-y+5=0 from

A) (2,1)   B) (2,-1)
C) (-2,1)   D)(-2,1)
1) A,B,C,D   2) B,A,D,C
3) B,D,C,A   4) B,C,D,A

12. I : Inclinations of parallel lines are equal

II: The slopes of parallel lines are equal

Then which of the following is true

1) Only I 2) Only II

3) both I & II 4) neither I nor II

13. I : Every first degree equation in x and y is $ax+by+c=0$, $(a,b) \neq (0,0)$ represent a straight line

II : Every first degree equation in x and y can be convert into slope intecept form

Then which of the following is true

1) Only I 2)only II

3) both I & II 4) neither I nor II

14. I : Length of the perpendicular from (x_1,y_1) to the line $ax+by+c=0$ is $\left|\frac{ax_1+by_1+c}{\sqrt{a^2+b^2}}\right|$

II : The equation of the line passing through(0,0) and perpendicular to $ax+by+c=0$ is $bx-ay=0$

Then which of the following is true.

1) only I 2) only II

3) both I & II 4) neither I nor II

15. I : The ratio in which $L \equiv ax+by+c=0$ divides the line segment joining $A(x_1,y_1)$ $B(x_2,y_2)$ is $\frac{-L_{11}}{L_{22}}$

II: the equation of the line in which (x_1,y_1) divides the line segment between the coordinate axes in the ratio m:n is $\frac{nx}{x_1}+\frac{my}{y_1}=m+n$

Then which of the following is true

1) only I 2) only II

3) both I&II 4)neither I nor II

16. I:The normal form of the line $\sqrt{3}x+y+4=0$ is $x\cos\frac{\pi}{6}+y\sin\frac{\pi}{6}+2=0$

II:The condition for the straight lines $ax+by+c=0$ and $px+qy+r=0$ to be perpendicular is $ap+bq=0$.

Then which of the following is true

1) only I 2) only II

3) both I &II 4) neither I nor II

17. I : The condition for three lines $ax+hy+g=0$, $hx+by+f=0$, $gx+fy+c=0$ tobe concurrent is $abc+2fgh-af^2-bg^2-ch^2=0$

II : If the lines $x-1=0$, $y+1=0$, $x+2y+k=0$ are concurrent then $k=3$.

Then which of the following is true.

1) only I 2) only II

3) both I & II 4) neither I or II

18. I : If the lines $ax+y+1=0$, $x+by+1=0$ and $x+y+c=0$ are concurrent $(a\neq0, b\neq0, c\neq0)$ then $\frac{1}{1-a}+\frac{1}{1-b}+\frac{1}{1-c}=1$

II: If A, B are points on the line $3x+4y+15=0$ such that OA=OB=9 units where 'O' is origin then area of the triangle OAB is $18\sqrt{2}$ sq.units.

Then which of the following is true

1) only I 2) only II

3) both I &II 4) neither I nor II

19. I:The points (a,0) (0,b) and (1,1) will be collinear if $\frac{1}{a}+\frac{1}{b}=1$

II: If $4a^2+9b^2-c^2+12ab=0$, then the family of lines $ax+by+c=0$ is either concurrent at (2,3) or at (-2,-3).

Then which of the following is true

1) only I 2) only II

3) both I &II 4) neither I nor II

20. I:A straight line is such that the algebraic sum of the distance from any no. of fixed points is zero. Then that line always passes through a fixed point

II: The base of the triangle lie along the line x=a and is of length a. If the area of the triangle is a^2 then the third vertex lies on x=-a or x=3a.

Then which of the following is true.

1) only I 2) only II

3) both I & II 4) neither I nor II

21. I:If the st.lines $ax+by+p=0$, $x\cos\alpha+y\sin\alpha=p$ enclose an angle between them and meet the st.line $x\sin\alpha - y\cos\alpha = 0$ in the same point, then $a^2+b^2=2$.

II: $y=10^x$ is the reflection of $y=\log^x_{10}$ with respect to the line y=x.

Then the which of the following is true

1) only I 2) only II

3) both I & II 4) neither I or II

22. A:The angle of inclination of the line $\sqrt{3}$x+y-2=0 is $\frac{2\pi}{3}$

R : If θ is the angle of inclination of the line ax+by=c=0 with positive x-axis then tan θ = $\frac{-a}{b}$. Then the correct answer

1) A, R are correct, R is correct explanation of A

2) A,R are correct, R is not correct explanation of A

3) A is true, R is false

4) A is false, R is true

23. A : The area of the triangle formed by the St.line 2x-3y+6=0 with coordinate axis is 3 sq. units

R: Area of triangle = 1/2.base.height

Then the correct answer

1) A, R are correct, R is correct expalanation of A

2) A,R are correct, R is not correct explanation of A

3) A is true, R is false

4) A is false, R is true

24. A:Thenormal form of the line x+y=$\sqrt{2}$ is x cos $\frac{\pi}{4}$+ y sin $\frac{\pi}{4}$= 1

R: Equation to normal form of a line is xcosα+ysinα = p (p>0). Then the correct answer

1) A, R are correct, R is correct explanation of A

2) A,R are correct, R is not correct explanation of A

3) A is true, R is false

4) A is false, R is true

25. A : The product of the slopes of the two lines passing through origin and equally inclined with axes is - 1.

R : Equations of the lines which are equally inclined with axes are x+y=0, x-y=0.

Then the correct answer

1) A, R are correct, R is correct explanation of A

2) A,R are correct, R is not correct explanation of A

3) A is true, R is false

4) A is false, R is true

26. A: The distance betwen the st.lines 2x-y+3=0, y=2x+4 is $\frac{1}{\sqrt{5}}$

R: Distance between parallel lines $ax+by+c_1=0$, $ax+by+c_2=0$ is $\frac{|c_1-c_2|}{\sqrt{a^2+b^2}}$

Then the correct answer

1) A, R are correct, R is correct explanation of A

2) A,R are correct, R is not correct explanation of A

3) A is true, R is false

4) A is false, R is true

27. A: The equation of the perpendicular bisector of the segment joining (4,-1) (2,3) is x-2y-1=0

R: Equation to perpendicular bisector of line segment joining $A(x_1,y_1)$, $B(x_2,y_2)$ is $2x(x_1-x_2)+2y(y_1-y_2)=(x_1^2+y_1^2) - (x_2^2+y_2^2)$

Then the correct answer

1) A, R are correct, R is correct explanation of A

2) A,R are correct, R is not correct explanation of A

3) A is true, R is false

4) A is false, R is true

28. A : if the angle between the lines kx-y+6=0, 3x-5y+7=0 is $\frac{\pi}{4}$ then k=4 is one of the value.

R : If θ is angle between the lines with slopes

m_1, m_2 then $\tan\theta = \frac{|m_1 - m_2|}{|1+m_1m_2|}$

Then the correct answer

1) A, R are correct, R is correct explanation of A

2) A,R are correct, R is not correct explanation of A

3) A is true, R is false

4) A is false, R is true

29. A: If P is perpendicular distance from the origin to the straight line $\frac{x}{a}+\frac{y}{b}=1$ then $\frac{1}{a^2}+\frac{1}{b^2}=\frac{1}{4p^2}$

R: The perpendicular distance from origin to the line ax+by+c=0 is $\frac{|c|}{\sqrt{a^2+b^2}}$

Then the correct answer

1) A, R are correct, R is correct explanation of A

2) A,R are correct, R is not correct explanation of A

3) A is true, R is false

4) A is false, R is true

30. A: The diagonals of the parallelogram whose sides are lx+my+n=0,lx+my+n_1=0, mx+ly+n=0,mx+ly+n_1=0 include an angle of $\frac{\pi}{2}$

R : In a parallelogram diagonals bisect each other

Then the correct answer

1) A, R are correct, R is correct explanation of A

2) A,R are correct, R is not correct explanation of A

3) A is true, R is false

4) A is false, R is true

31. A:The equation of the base of an equilateral triangle is x+y-2=0 and the vertex is (2,-1) then the length of side is $\sqrt{\frac{2}{3}}$

R: For equilateral triangle altitude length = $\frac{\sqrt{3}}{2}$. side length

Then the correct answer

1) A, R are correct, R is correct explanation of A

2) A,R are correct, R is not correct explanation of A

3) A is true, R is false

4) A is false, R is true

32. A: The algebraic sum of the distances from the point (2,0), (0,2) and (4,4) to a variable line is zero, then that line passes through (2,2)

R: As the algebraic sum of the distances is zero, then the line passes through centroid

Then the correct answer

1) A, R are correct, R is correct explanation of A

2) A,R are correct, R is not correct explanation of A

3) A is true, R is false

4) A is false, R is true

33. A : The area of the triangle formed by the line which is passing through (3,4) with coordinate axes is 24 sq.units

R: If the line passes (p,q) then area of the triangle with coordinate axes 2pq sq.units.

Then the correct answer

1) A, R are correct, R is correct explanation of A

2) A,R are correct, R is not correct explanation of A

3) A is true, R is false

4) A is false, R is true

34. A: The area of the figure formed by the lines $x \pm y \pm a = 0$ in $2a^2$ sq.units

R: Area of the figure formed by the lines = 4. Area of ΔOAB

Then the correct answer

1) A, R are correct, R is correct explanation of A

2) A,R are correct, R is not correct explanation of A

3) A is true, R is false

4) A is false, R is true

35. A : The no.of lines that can be drawn through the point (4,-5) at a distance of 10 units from the point (1,3) is zero

R : Required distance is greater than the distance between given points or distance 10 units from (1,3) through (4,-5) is not possible

Then the correct answer

1) A, R are correct, R is correct explanation of A

2) A,R are correct, R is not correct explanation of A

3) A is true, R is false

4) A is false, R is true

36. A : The distance between the St.lines $y=mx+c_1$, $y=mx+c_2$ is $|c_1-c_2| \Rightarrow m=0$

R : The distance between parallel lines $ax+by+c_1=0$, $ax+by+c_2=0$ is $\left|\frac{c_1-c_2}{\sqrt{a^2+b^2}}\right|$

Then the correct answer

1) A,R are correct, R is correct explanation of A

2) A,R are correct, R is not correct explanation of A

3) A is true, R is false

4) A is false, R is true

KEY

1) 3	2) 2	3) 3	4) 1	5) 2
6) 2	7) 2	8) 2	9) 2	10) 1
11) 2	12) 1	13) 1	14) 3	15) 3
16) 2	17) 1	18) 3	19) 3	20) 3
21) 3	22) 1	23) 2	24) 1	25) 1
26) 1	27) 1	28) 1	29) 4	30) 2
31) 1	32) 1	33) 1	34) 1	35) 1
36) 1				

LEVEL - V

1. In a triangle the point of concurrence of all altitudes is called orthocentre, the point of concurrence of all medians is called centroid and the point of concurrence of all perpendicular bisectors of the sides is called circumcentre

i) The orthocentre of the triangle formed by (1,0), (2,-4) and (-5,-2) is

1) $\left(\frac{11}{13},\frac{7}{13}\right)$ 2) $\left(\frac{11}{13},\frac{-7}{13}\right)$

3) $\left(\frac{-11}{13},\frac{7}{13}\right)$ 4) $\left(\frac{-11}{13},\frac{-7}{13}\right)$

ii) The circumcentre of the triangle whose sides are $3x-y-5=0$; $x+2y-4=0$ and $5x+3y+1=0$ is

1) $\left(\frac{6}{7},\frac{2}{7}\right)$ 2) $\left(\frac{6}{7},\frac{-2}{7}\right)$

3) $\left(\frac{-6}{7},\frac{2}{7}\right)$ 4) $\left(\frac{-6}{7},\frac{-2}{7}\right)$

iii) The centroid of the triangle formed by $\left(1,\sqrt{3}\right)$, $\left(1,-\sqrt{3}\right)$, $\left(3,-\sqrt{3}\right)$ is

1) $\left(\frac{5}{3},\frac{-1}{\sqrt{3}}\right)$ 2) $\left(\frac{5}{3},\frac{1}{\sqrt{3}}\right)$

3) $\left(\frac{3}{5},\frac{-1}{\sqrt{3}}\right)$ 4) $\left(\frac{3}{5},\frac{1}{\sqrt{3}}\right)$

iv) If the lines $4x+3y-1=0$; $x-y+5=0$ and $kx+5y-3=0$ are concurrent then k=

1) 4 2) 5

3) 6 4) 7

2. The locus of the point which is equidistant from two intersecting lines is an angular bisector of two lines and the locus of the point which is equidistant from two given points is a perpendicular bisector of the line joining the given points.

i) The equation to the perpendicular bisector of the line segment of the line $\frac{x}{a}+\frac{y}{b}=1$ cut off by the axes is

1) $ax-by-a^2+b^2=0$

2) $ax+by-a^2+b^2=0$

3) $2ax+2by-a^2+b^2=0$

4) $2ax-2by-a^2+b^2=0$

ii) If x+3y=16 is the perpendicular bisector of the line joining A, B and B=(3,1) then A is

1) (5,-7) 2) (5,7)
3) (4, 4) 4) (4,-4)

iii) The acute angle bisector between the lines 3x-4y+5=0 and 5x+12y-26=0 is

1) 7x-56y + 32 = 0 2) 9x - 3y+13=0
3) 14x-112y+65=0 4) 7x - 13y + 9=0

iv) The obtuse angle bisector between the lines 2x-y-4=0 and x-2y+10 = 0 is

1) x-y+7=0 2) 3x-y+5=0
3) x+y-14=0 4) 2x+3y-5=0

KEY

1.	i) 2	ii) 3	iii) 1	iv) 3
2.	i) 4	ii) 2	iii) 3	iv) 3

PREVIOUS EAMCET QUESTIONS

2005

1. The area (in sq. units) of the triangle formed by the lines x=0; y=0 and 3x+4y=12 is

1) 3 2) 4
3) 6 4) 12

2. If PM is the perpendicular from P (2,3) on to the line x+y=3 then the co-ordinates of M are

1) (2,1) 2) (-1,4)
3) (1,2) 4) (4,-1)

3. The equation of the straight line perpendicular to 5x-2y=7 and passing through the point of intersection of the lines 2x+3y=1 and 3x+4y=6 is

1) 2x+5y+17=0 2) 2x+5y-17=0
3) 2x-5y+17=0 4) 2x-5y=17

2004

4. Suppose A, B are two points on 2x-y+3=0 and P(1,2) is such that PA=PB. Then themid point of AB is

1) $\left(\frac{-1}{5},\frac{13}{5}\right)$ 2) $\left(\frac{-7}{5},\frac{9}{5}\right)$

3) $\left(\frac{7}{5},\frac{-9}{5}\right)$ 4) $\left(\frac{-7}{5},\frac{-9}{5}\right)$

2003

5. If the lines 4x+3y-1=0; x-y+5=0 and kx+5y-3=0 are concurrent then k=

1) 4 2) 5 3) 6 4) 7

2002

6. If a straight line perpendicular to 2x-3y+7=0 forms a triangle with the coordinate axes whose area is 3sq. units, then the equation of the straight line (s) is

1) $3x+2y=\pm2$ 2) $3x+2y=\pm6$
3) $3x+2y=\pm8$ 4) $3x+2y=\pm4$

7. If (-2, 6) is the image of the point (4,2) with respect to the line L=0, then L=

1) 6x-4y-7 2) 2x+3y-5
3) 3x - 2y+5 4) 3x-2y+10

2001

8. The line 2x+3y=6, 2x+3y=8 cut the X-axis at a A,B respectively. A line *l* drawn through the point (2,2) meets the X-axis at C in such a way that abscissae of A,B,C are in arithmetic Progression. then the equation of the line *l* is

1) 2x+3y=10 2) 3x+2y=10
3) 2x-3y=10 4) 3x-2y=10

9. The number of circles that touch all the straight lines x+y - 4 = 0, x - y+2 = 0 and y = 2 is

1) 1 2) 2 3) 3 4) 4

10. For all values of a and b the line (a+ab) x+ (a-b)y + (a+5b) = 0 passes through the point

1) (-1,2) 2) (2, -1) 3) (-2, 1) 4) (1,-2)

11. The incentre of the triangle formed by the lines x+y=1, x=1, y=1 is

1) $\left(1-\frac{1}{\sqrt{2}},1-\frac{1}{\sqrt{2}}\right)$ 2) $\left(1-\frac{1}{\sqrt{2}},\frac{1}{\sqrt{2}}\right)$

3) $\left(\frac{1}{\sqrt{2}},\frac{1}{\sqrt{2}}\right)$ 4) $\left(\frac{1}{\sqrt{2}},1-\frac{1}{\sqrt{2}}\right)$

2000

12. The area of the triangle formed by the axes and the line (coshα - sinhα) x+ (coshα + sinhα) y=2 in square units is

1) 4 2) 3 3) 2 4) 1

13. If the points (1,2) and (3,4) were to be on the same side of the line 3x-5y+a=0 then

1) 7 < a < 11 2) a = 7

3) a = 11 4) a <7 or a > 11

14. The coordinates of the image of the origin O with respect to the straight line x+y+1=0 are

1) $\left(-\frac{1}{2},-\frac{1}{2}\right)$ 2) (-2, -2)

3) (1,1) 4) (-1, -1)

1999

15. The equation of the straight line making an intercept of 3 units on the y-axis and inclined at 45^0 to the x-axis is

1) y = x-1 2) y= x+3

3) y = 45x + 3 4) y = x+45

16. If the straight lines y=4-3x, ay=x+10 and 2y+bx+9=0 represnet the three consecutive sides of rectangle then ab =

1) 18 2) -3 3) 1/2 4) -1/3

17. The equation of the line passing through the intersection of the lines, x-2y+5=0 and 3x+2y+7=0 and perpendicular to the line x-y=0

1) x+y=0 2) x+y=2

3) x+y+2=0 4) x+y+1=0

18. The reflection of the point (6,8) in the line x=y is

1) (4,2) 2) (-6,-8) 3) (-8,-10) 4) (,8,6)

1998

19. The perpendicular distance from (1,2) to the straight line 12x+5y=7 is

1) 15/13 2) 12/13 3) 5/13 4) 7/13

20. k is a nonzero constant. If k=$\frac{a+b}{ab}$ then the straight line $\frac{x}{a}+\frac{y}{b}$=1 passes through the point

1) (k,k) 2) (1/k, 1/k)

3) (1,1) 4) (k,1/k)

21. Let a and b be nonzero reals such that a b Then the equation of the line passing through theorigin and the point of inter section of x/a + y/b =1 and x/b + y/a=1

1) ax+by=0 2) bx+ay=0

3) y-x=0 4) x+y=0

1997

22. A line passing through A(1,-2) has slope 1. The points on the line at a distance of $4\sqrt{2}$ units from A are

1) (3, -6), (5, 2) 2) (-3, -6), (5, -2)

3) (-3, -6) (5,2) 4) (3, 6) (-5,2)

23. If the point of intersection of kx+4y+2=0, x-3y+5=0 lies on 2x+7y-3=0 then k=

1) 2 2) 3 3)-2 4) -3

24. If 2x+3y+4=0 is the perpendicular bisector of the segment joining the points A(1,2) and B (α β) then the value of $\alpha+\beta$ is

1) $-\frac{81}{13}$ 2) $-\frac{136}{13}$ 3) $-\frac{135}{13}$ 4) $-\frac{134}{5}$

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25. the foot of the perpendicular from the point (3,4) on the line 3x-4y+5=0 is

1) $\left(\frac{81}{25},\frac{92}{25}\right)$ 2) $\left(\frac{92}{25},\frac{81}{25}\right)$

3) $\left(\frac{46}{25},\frac{54}{25}\right)$ 4) $\left(\frac{-81}{25},\frac{92}{25}\right)$

26. The angle between the lines x cos α +y sin α= p_1 and x cos β + y sin β= p_2 where $\alpha > \beta$ is

1) $\alpha + \beta$ 2) $\alpha - \beta$ 3) $\alpha\beta$ 4) $2\alpha-\beta$

27. The variable line $\frac{x}{a}+\frac{y}{b}$ =1 such that a+b=10. The locus of the midpoint of the potion of the line intercepted between the axes is

1) x+y=10 2) 10x+5y=1

3) x+y=5 4) 5x+10y=1

KEY

1) 3	2) 3	3) 1	4) 1	5) 3
6) 2	7) 3	8) 1	9) 4	10) 3
11) 3	12) 3	13) 4	14) 4	15) 2
16) 1	17) 2	18) 4	19) 1	20) 2
21) 3	22) 3	23) 2	24) 1	25) 1
26) 2	27) 3			