

TAHIR MEHMOOD

M.Sc Math
0345-65107792nd Year

CH#4

معروضی (ریاضی)

16

A point $P(a, b)$ lies on a plane xy where
 "a" is called Abscissa and "b" is called ordinate

Distance of $P(a, b)$ from x -axis is "b"

Distance of $P(a, b)$ from y -axis is "a"

$P(a, b)$ lies in 1st Quadrant if $a > 0$; $b > 0$

$P(a, b)$ lies in 2nd Quadrant if $a < 0$; $b > 0$

$P(a, b)$ lies in 3rd Quadrant if $a < 0$; $b < 0$

$P(a, b)$ lies in 4th Quadrant if $a > 0$; $b < 0$

* The distance between $A(x_1, y_1)$ and $B(x_2, y_2)$ is defined as:

$$|AB| = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2} \text{ or } |AB| = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

* If $A(x, y)$ divides $P(x_1, y_1)$ and $Q(x_2, y_2)$ in the ratio $K_1 : K_2$ then

$$A(x, y) = A\left(\frac{K_1 x_2 + K_2 x_1}{K_1 + K_2}, \frac{K_1 y_2 + K_2 y_1}{K_1 + K_2}\right)$$

* If $P(x, y)$ is mid point of $A(x_1, y_1)$ and $B(x_2, y_2)$ then

$$P(x, y) = P\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$$

* Point of intersection of medians is called Centroid.

* Point of intersection of altitudes is called Orthocentre.

* Point of intersection of angle bisectors is called in-centre

* Point of intersection of right bisectors is called Circumcentre.

* If $L_1 \parallel L_2$ then $m_1 = m_2$ where m is slope of line.

* If $L_1 \perp L_2$ then $m_1 \cdot m_2 = -1$

* A, B, C are collinear then $m_{AB} = m_{BC} = m_{AC}$

* If L is \parallel to x -axis then $m = 0$

* If L is \parallel to y -axis then $m = \infty$

* $ax + by + c = 0$ is General Equation of Straight Line

* Slope of $ax + by + c = 0$ is $-\frac{a}{b}$

* $ax + by + c = 0$ is \parallel to x -axis if $a = 0$

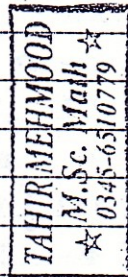
* $ax + by + c = 0$ is \parallel to y -axis if $b = 0$

* $ax + by + c = 0$ is inclined line if $a \neq 0, b \neq 0$.

* $a_1 x + b_1 y + c_1 = 0$ and $a_2 x + b_2 y + c_2 = 0$ are parallel if $a_1 b_2 - a_2 b_1 = 0$

* $a_1 x + b_1 y + c_1 = 0$ and $a_2 x + b_2 y + c_2 = 0$ are perpendicular if $a_1 a_2 + b_1 b_2 = 0$

* $P(x_1, y_1)$ lies above, on or below $ax + by + c = 0$ if $ax_1 + by_1 + c \geq 0$



* $y = mx + c$ is called Slope intercept form of Line. (17)

* $\frac{x}{a} + \frac{y}{b} = 1$ is called Two intercepts form of Line.

* $y - y_1 = m(x - x_1)$ is called point Slope form of Line.

* $\frac{y - y_1}{y_2 - y_1} = \frac{x - x_1}{x_2 - x_1}$ is called Two points form of Line.

* $x \cos \alpha + y \sin \alpha = p$ is called Normal form of Line.

* $\frac{x - x_1}{\cos \alpha} = \frac{y - y_1}{\sin \alpha} = r$ is called Symmetric form of Line.

* Points $A(x_1, y_1), B(x_2, y_2), C(x_3, y_3)$ are collinear if $\begin{vmatrix} x_1 & y_1 & 1 \\ x_2 & y_2 & 1 \\ x_3 & y_3 & 1 \end{vmatrix} = 0$

* $a_1x + b_1y + c_1 = 0, a_2x + b_2y + c_2 = 0, a_3x + b_3y + c_3 = 0$ are concurrent if $\begin{vmatrix} a_1 & b_1 & c_1 \\ a_2 & b_2 & c_2 \\ a_3 & b_3 & c_3 \end{vmatrix} = 0$

* Area of triangle form by $A(x_1, y_1), B(x_2, y_2), C(x_3, y_3)$ is $\Delta = \frac{1}{2} \begin{vmatrix} x_1 & y_1 & 1 \\ x_2 & y_2 & 1 \\ x_3 & y_3 & 1 \end{vmatrix}$

* Angle between L_1 and L_2 is $\tan \theta = \frac{m_2 - m_1}{1 + m_1 m_2}$

* $ax^2 + 2hxy + by^2 = 0$ represents a pair of Straight lines through the origin.

* Lines formed by $ax^2 + 2hxy + by^2 = 0$ will be

i) real and distinct if $h^2 - ab > 0 \Rightarrow h^2 > ab$

ii) real and coincident if $h^2 - ab = 0 \Rightarrow h^2 = ab$

iii) imaginary if $h^2 - ab < 0 \Rightarrow h^2 < ab$

* Angle between lines determine by $ax^2 + 2hxy + by^2 = 0$ is

$$\tan \theta = \frac{2\sqrt{h^2 - ab}}{a + b}$$

* Product of slope of lines determine by $ax^2 + 2hxy + by^2 = 0$ is $m_1 m_2 = \frac{a}{b}$ and $m_1 + m_2 = \frac{-2h}{b}$

* Distance of $P(x_1, y_1)$ from $L: ax + by + c = 0$ is

$$d = \frac{|ax_1 + by_1 + c|}{\sqrt{a^2 + b^2}}$$

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If $d = 0$ then $P(x_1, y_1)$ lies on Line $ax + by + c = 0$

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M.Sc Math
0345-6510779

2nd year

CH # 4

معروضی (ریاضی)

18

- 1) Point of intersection of axes is called _____
 a- Origin b- Co-ordinate c- Abscissa d- Ordinate
- 2) In $P(x, y)$, x is called _____
 a- Origin b- Ordinate c- Abscissa d- Co-ordinates.
- 3) In $P(x, y)$, y is called _____
 a- Origin b- Ordinate c- Abscissa d- None of these.
- 4) _____ point lies on x axis.
 a- $(2, 3)$ b- $(2, 0)$ c- $(0, 3)$ d- $(-2, -3)$
- 5) $P(x, y)$ lies on x -axis if _____
 a- $x = y$ b- $x = -y$ c- $x = 0$ d- $y = 0$
- 6) $P(x, y)$ lies on y -axis if _____
 a- $x = y$ b- $x = 0$ c- $y = 0$ d- $y = -x$
- 7) $P(x, y)$ lies in _____ quadrant if $x > 0$ and $y < 0$
 a- 1st b- 2nd c- 3rd d- 4th
- 8) $P(2, 3)$ has _____ distance from y axis.
 a- 2 b- 3 c- 5 d- 1
- 9) If $A(x_1, y_1)$ and $B(x_2, y_2)$ then $|AB| =$ _____
 a- $\sqrt{(x_1-x_2)^2 + (y_1-y_2)^2}$ b- $\sqrt{(x_2-x_1)^2 - (y_1-y_2)^2}$ c- $\sqrt{(x_1+x_2)^2 - (y_1+y_2)^2}$ d- $\sqrt{(x_1+x_2)^2 + (y_1+y_2)^2}$
- 10) If $|AB|^2 = |BC|^2 + |AC|^2$ then ABC is _____ triangle.
 a- Isocelles. b- Equilateral c- Right d- Abtuse
- 11) If $P(x, y)$ divides AB in the ratio $1:1$ then P is _____ of AB .
 a- Mid point b- Trisecting point c- Coincident point d- Corresponding Point
- 12) Medians of a triangle intersect in the ratio _____
 a- $1:3$ b- $3:2$ c- $1:2$ d- $1:1$
- 13) _____ of triangle are Concurrent.
 a- Altitudes b- Medians c- Right bisectors d- a, b, c all
- 14) $(\frac{x_1+x_2+x_3}{3}, \frac{y_1+y_2+y_3}{3})$ are Co-ordinates of _____ of $\triangle ABC$.
 a- Centriod b- In Centre c- CircumCentre d- Orthocentre.
- 15) $(\frac{ax_1+bx_2+cx_3}{a+b+c}, \frac{ay_1+by_2+cy_3}{a+b+c})$ are Coordinates of _____ of $\triangle ABC$.
 a- In Centre b- Centriod c- Orthocentre d- CircumCentre.
- 16) A, B, C are collinear if _____
 a- $|AB| = |AC| = |BC|$ b- $|AC| + |BC| = |AB|$ c- $|AC| = |AB| + |BC|$ d- $|AB| + |BC| + |AC| = 0$
- 17) $P(-2, 3)$ lies in _____ quadrant. a- 1st b- 2nd c- 3rd d- 4th

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 M.Sc. Math
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M.Sc Math
0345-65107792nd Year

Math (OBJECTIVE)

(19)

18) Which point is equidistant from vertices of triangle?

a- In Centre b- Centroid c- Circum Centre d- Ortho centre

19) _____ remains unrotated during rotation of axes.

a- Origin b- x-co-ordinate c- y co-ordinate d- x,y both

20) Inclination α of a line l is its anticlockwise angle then _____a- $0 < \alpha < 90^\circ$ b- $-90^\circ < \alpha < 90^\circ$ c- $0^\circ < \alpha < 180^\circ$ d- $0^\circ < \alpha < 360^\circ$

21) Inclination of line "l" parallel to x-axis is _____

a- 0° b- 45° c- 90° d- 135°

22) Inclination of line "l" parallel to y-axis is _____

a- 0° b- 45° c- 90° d- 135° 23) If α is inclination of line "l" then its Slope or gradient is _____a- $\sin \alpha$ b- $\cos \alpha$ c- $\tan \alpha$ d- $\cot \alpha$ 24) If $A(x_1, y_1)$ and $B(x_2, y_2)$ then slope of AB is _____a- $\frac{x_2 - x_1}{y_2 - y_1}$ b- $\frac{y_1 - y_2}{x_2 - x_1}$ c- $\frac{x_1 - x_2}{y_1 - y_2}$ d- $\frac{y_1 - y_2}{x_2 - x_1}$ 25) The perpendicular distance of line $12x + 5y = 7$ from $(0,0)$ is _____a- $\frac{1}{13}$ b- $\frac{13}{7}$ c- $\frac{7}{13}$ d- 1326) If $a=0$ in $ax+by+c=0$ then line is _____a- \parallel to x-axis b- \parallel to y axis c- Inclined d- Passing through $(0,0)$ 27) Slope of $ax+by+c=0$ is _____a- a/b b- $-a/b$ c- b/a d- $-b/a$ 28) If l_1 is parallel to l_2 then _____a- $m_1 + m_2 = 0$ b- $m_1 - m_2 = 0$ c- $m_1 = -1/m_2$ d- $m_1 m_2 = -1$ 29) If l_1 is perpendicular to l_2 then _____a- $m_1 = -m_2$ b- $m_1 = m_2$ c- $m_1 m_2 = 1$ d- $m_1 m_2 = -1$ 30) If $b=0$ in $ax+by+c=0$ then line is _____a- \parallel to x-axis b- \parallel to y axis c- Inclined d- Passes through $(0,0)$ 31) $x=K$ is a line \parallel to _____

a- X-axis b- Y-axis c- Both axes d- None

32) $y=K$ is a line \parallel to _____

a- X axis b- Y axis c- Both axes d- None

33) $y=K$ is above x axis if _____a- $K > 0$ b- $K = 0$ c- $K < 0$ d- None34) $ax+by+c=0$ represents a _____

a- line b- Circle c- Ellipse d- Parabola

TAHIR MEHMOOD

M.Sc Math
0345-6510779

2nd Year

Math (OBJECTIVE)

(20)

- 35) If m is the slope of line passing through $(e,0)$ then its equation is _____
 a- $y = mx + c$ b- $y = m + x$ c- $y = mx$ d- $xy = m$
- 36) Equation of line parallel to x -axis is _____
 a- $x = 0$ b- $x = y$ c- $y = a$ d- $x = a$
- 37) $l: ax + by + c = 0$ has matrix form _____
 a- $[ax - by] = [c]$ b- $[ax \ by] [c]$ c- $[ax + by] = [c]$ d- $[a \ b] \begin{bmatrix} x \\ y \end{bmatrix} = [-c]$
- 38) The distance of point $(-1, 2)$ from x -axis is _____
 a- 2 b- 1 c- -1 d- -2
- 39) If $l_1 \perp l_2$ with slopes m_1, m_2 then $m_1 =$ _____
 a- $-m_2$ b- m_2 c- $1/m_2$ d- $-1/m_2$
- 40) Slope of $2x + 5 = 0$ is _____
 a- 5 b- -5 c- $-5/2$ d- undefined
- 40) $y = k$ represents x -axis if _____
 a- $k < 0$ b- $k = 0$ c- $k > 0$ d- $x = k$
- 41) Slope intercept form of line is _____
 a- $y = mx + c$ b- $x = my + c$ c- $\frac{x}{a} + \frac{y}{b} = 1$ d- $x \cos \alpha + y \sin \alpha = p$
- 42) Point Slope form of line through $P(x_1, y_1)$ is _____
 a- $\frac{x_1}{a} + \frac{y_1}{b} = 1$ b- $x_1 \cos \alpha + y_1 \sin \alpha = p$ c- $y - y_1 = m(x - x_1)$ d- $\frac{y - y_1}{y_2 - y_1} = \frac{x - x_1}{x_2 - x_1}$
- 43) If _____, m is positive.
 a- $0^\circ < \alpha < 90^\circ$ b- $90^\circ < \alpha < 180^\circ$ c- $0^\circ < \alpha < 180^\circ$ d- $0^\circ < \alpha < 360^\circ$
- 44) If _____, m is negative.
 a- $0^\circ < \alpha < 90^\circ$ b- $90^\circ < \alpha < 180^\circ$ c- $0^\circ < \alpha < 180^\circ$ d- $0^\circ < \alpha < 360^\circ$
- 45) $x = b$ represents y axis if _____
 a- $b < 0$ b- $b = 0$ c- $b > 0$ d- $y = b$
- 46) If a line intercepts x -axis at $(a, 0)$, then a is called _____
 a- x -intercept b- y -intercept c- Both a, b d- None
- 47) If a line intercepts y -axis at $(0, b)$, then b is called _____
 a- x -intercept b- y -intercept c- Both a, b d- None
- 48) Equation of line _____ if slope is 2 and y intercept is 5.
 a- $y = 5x + 2$ b- $y = 2x + 5$ c- $x = 5y + c$ d- $x = 2y + 5$
- 49) $\frac{x - x_1}{\cos \alpha} = \frac{y - y_1}{\sin \alpha} = r$ is called _____ form of Eq. of St. Line.
 a- Symmetric b- Normal c- Point Slope d- Two intercepts.
- 50) Slope of $2x + y - 11 = 0$ is _____
 a- 2 b- -2 c- $1/2$ d- $-1/2$

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M.Sc. Math
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51) If $A(x_1, y_1), B(x_2, y_2)$ then Slope of AB is undefined if
 a- $x_1 = y_1$ b- $x_1 = x_2$ c- $y_1 = y_2$ d- $x_2 = y_1$

52) Slope of line \perp to $5x + 8y + 2 = 0$ is

a- $-5/8$ b- $5/8$ c- $8/5$ d- $-8/5$

53) $x \cos \alpha + y \sin \alpha = p$ is _____ Form of Equation of Straight line.

a- Symmetric b- Normal c- Two points d- Slope intercept.

54) $ax + by + c = 0$ will be inclined line if

a- $a \neq 0$ b- $b \neq 0$ c- $a \neq 0, b \neq 0$ d- $a = 0 = b$

55) Perpendicular distance of $3x + 4y + 10 = 0$ from $(0, 0)$ is

a- 0 b- 1 c- 2 d- 3

56) Slope of x -axis is

a- 0 b- 1 c- 2 d- undefined

57) Slope of y -axis is

a- 0 b- 1 c- -1 d- undefined

58) Slope intercept form of $ax + by + c = 0$ is

a- $y = \frac{a}{b}x + \frac{c}{b}$ b- $y = -\frac{a}{b}x - \frac{c}{b}$ c- $y = \frac{bx}{a} + \frac{c}{a}$ d- $y = -\frac{bx}{a} - \frac{c}{a}$

59) Perpendicular distance of $ax + by + c = 0$ from origin is

a- $\frac{c}{a^2 + b^2}$ b- $\frac{|c|}{\sqrt{a^2 + b^2}}$ c- $\frac{a}{\sqrt{a^2 + b^2}}$ d- $\frac{b}{\sqrt{a^2 + b^2}}$

60) $P(x_1, y_1)$ lies _____ the line if $ax_1 + by_1 + c > 0$

a- On b- Above c- Below d- None

61) $P(x_1, y_1)$ lies _____ the line if $ax_1 + by_1 + c = 0$.

a- On b- Above c- Below d- None

62) $P(x_1, y_1)$ lies _____ the line if $ax_1 + by_1 + c < 0$

a- On b- Above c- Below d- None

63) $P(x_1, y_1)$ lies below the line $ax + by + c = 0$ if

a- $ax_1 + by_1 + c > 0$ b- $ax_1 + by_1 + c = 0$ c- $ax_1 + by_1 + c < 0$ d- None

64) _____ line bisect 1st and 3rd Quadrant.

a- $x - y = 0$ b- $x + y = 0$ c- $2x - y = 0$ d- $x - 2y = 0$

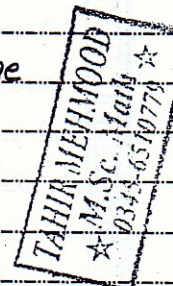
65) $a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$ are parallel if

a- $a_1a_2 + b_1b_2 = 0$ b- $a_1b_2 + a_2b_1 = 0$ c- $a_1b_1 + a_2b_2 = 0$ d- $a_1b_2 - a_2b_1 = 0$

66) $a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$ are perpendicular if

a- $a_1a_2 + b_1b_2 = 0$ b- $a_1b_1 + a_2b_2 = 0$ c- $a_1a_2 - b_1b_2 = 0$ d- $a_1b_2 - a_2b_1 = 0$

67) _____ lies on $2x + 3y = 0$. a- $(2, 3)$ b- $(-2, -3)$ c- $(0, 0)$ d- $(0, 3)$



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M.Sc Math
0345-6510779

2nd year

Math (OBJECTIVE)

(23)

85) Angle between lines $ax^2 + 2hxy + by^2 = 0$ is $\tan \theta =$

- a. $\frac{2\sqrt{h^2 - ab}}{a+b}$ b. $\frac{2\sqrt{h^2 - ab}}{a-b}$ c. $\frac{2\sqrt{h^2 + ab}}{a+b}$ d. $\frac{2\sqrt{h^2 + ab}}{a-b}$

86) The lines $ax^2 + 2hxy + by^2 = 0$ are parallel if

- a) $h^2 - ab < 0$ b. $h^2 - ab = 0$ c. $h^2 - ab > 0$ d. None.

87) The lines $ax^2 + 2hxy + by^2 = 0$ are perpendicular if

- a. $h^2 - ab = 0$ b. $a - b = 0$ c. $a + b = 0$ d. $ab = h^2$

88) Product of Slopes of lines formed by $ax^2 + 2hxy + by^2 = 0$ is

- a. b/a b. a/b c. $-a/b$ d. $-b/a$

89) Sum of Slopes of lines formed by $ax^2 + 2hxy + by^2 = 0$ is

- a. $\frac{2h}{b}$ b. $-\frac{2h}{b}$ c. $\frac{2h}{a}$ d. $-\frac{2h}{a}$

90) Equation of y-axis is

- a. $x = k$ b. $y = k$ c. $x = 0$ d. $y = 0$

91) Equation of x-axis is

- a. $x = k$ b. $y = k$ c. $x = 0$ d. $y = 0$

92) General Form of Equation of St. Line is

- a. $ax + by - c = 0$ b. $ax - by + c = 0$ c. $ax + by + c = 0$ d. $ax - by - c = 0$

93) Joint Eq. of St. Lines $x - 2y = 0$ and $x + 3y = 0$ is

- a. $x^2 - xy + 6y^2 = 0$ b. $x^2 - xy - 6y^2 = 0$ c. $x^2 + xy + 6y^2 = 0$ d. $x^2 + xy - 6y^2 = 0$

94) Slope of A(2,1) and B(5,1) is

- a. 0 b. 3 c. 2 d. 5

95) Line \perp to $ax + by + c = 0$ through origin is

- a. $ax + by = 0$ b. $bx + ay = 0$ c. $ax - by = 0$ d. $bx - ay = 0$

96) Angle between lines l_1 and l_2 is 90° if

- a. $m_1 - m_2 = 0$ b. $m_1 = m_2$ c. $m_1 + m_2 = 1$ d. $m_1 m_2 + 1 = 0$

97) Concurrent lines have _____ Common point.

- a. one b. Two c. Three d. infinite

98) Area of $\begin{vmatrix} x_1 & y_1 & 1 \\ x_2 & y_2 & 1 \\ x_3 & y_3 & 1 \end{vmatrix}$

- a. Triangle b. Rectangle c. Trapezium d. Circle

99) Distance of P(2,7) from x-axis is

- a. 0 b. 1 c. 2 d. 7

100) The lines $a_1x + b_1y + c_1 = 0$, $a_2x + b_2y + c_2 = 0$, $a_3x + b_3y + c_3 = 0$ are _____ if

- a. Coplaner b. Concurrent c. Parallel d. Perpendicular
- | | | | |
|-------|-------|-------|-----|
| a_1 | b_1 | c_1 | = 0 |
| a_2 | b_2 | c_2 | |
| a_3 | b_3 | c_3 | |

The End.

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