COORDINATE GEOMETRY
PPT-2

SUBJECT : MATHEMATICS
CHAPTER NUMBER: 07
CHAPTER NAME : COORDINATE GEOMETRY

Website: www.odmegroup.org
Email: info@odmps.org
Toll Free: **1800 120 2316**
Sishu Vihar, Infocity Road, Patia, Bhubaneswar- 751024

PREVIOUS KNOWLEDGE TEST

1.The part of intersection of the X-axis and Y-axis is called the origin O andthe co-ordinates of O are (0, 0).

2.The perpendicular distance of a point P from the Y-axis is the ‘x’ co-ordinate and is called the abscissa.

3.The perpendicular distance of a point P from the X-axis is the ‘y’ co-ordinate and is called the ordinate.

4. Any point on the X-axis is of the form (x, 0).

5 .Any point on the Y-axis is of the form (0, y)

6.The distance between two points P(x_1, y_1) and Q(x_2, y_2)) is given by

PQ = $\sqrt{(X_2 - X_1)^2 + (Y_2 - Y_1)^2}$

7. . If O is the origin, the distance of a point P(x, y) from the origin O(0, 0) is given by

OP = $\sqrt{(x^2 + y^2)}$

LEARNING OUTCOME

1 . Students will be able to apply distance formula to know whether three points are collinear or not.

2.Students will be able to apply distance formula to solve on problems based on geometrical figure..

3. Students will be able to apply distance formula to solve on problems based on equidistant points.

To know what type of quadrilateral ;

https://youtu.be/4P56X6pQV8Q (10.05)

Problems based on geometrical figure.
To show that a given figure is a
Parallelogram – prove that the opposite sides are equal.
Rectangle – prove that the opposite sides are equal, and the diagonals are equal.
Parallelogram but not rectangle – prove that the opposite sides are equal, and the diagonals are not equal.
Rhombus – prove that the four sides are equal.
Square – prove that the four sides are equal, and the diagonals are equal.
Rhombus but not square – prove that the four sides are equal, and the diagonals are not equal.
Isosceles triangle – prove any two sides are equal.
Equilateral triangle – prove that all three sides are equal.
Right triangle – prove that sides of triangle satisfy Pythagoras theorem.

1.Show that the points A(1, 2), B(5, 4), C(3, 8) and D(– 1, 6) are the vertices of a square

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A(1, 2), B (5, 4),C(3, 8) and D (–1, 6)

$AB = \sqrt{4^2+2^2} = \sqrt{16+4} = \sqrt{20}$;

$BC = \sqrt{(-2)^2+(4)^2} = \sqrt{4+16} = \sqrt{20}$

$CD = \sqrt{(-4)^2+(-2)^2} = \sqrt{16+4} = \sqrt{20}$;

$DA = \sqrt{(-2)^2+(4)^2} = \sqrt{4+16} = \sqrt{20}$

Here AB = BC = CA = DA

$AC = \sqrt{2^2+6^2} = \sqrt{40}$

and $BD = \sqrt{(-6)^2+(2)^2} = \sqrt{36+4} = \sqrt{40}$

All sides of quadrilateral are equal and diagonals are equal.

∴ ABCD is square.

2.Find the point on the x-axis which is equidistant from

(2, –5) and (–2, 9)

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(2, –5) and (–2, 9)

Let A (2, -5) and B (-2, 9) be the given points.

Also let P (x, 0) be the point on x-axis such that

$$PA = PB$$

Then $$PA^2 = PB^2$$

$$\Rightarrow \quad (x-2)^2 + (0+5)^2 = (x+2)^2 + (0-9)^2$$

$$\Rightarrow \quad (x-2)^2 - (x+2)^2 = 81 - 25$$

$$\Rightarrow \quad (x-2+x+2)(x-2-x-2) = 56$$

$$\Rightarrow \quad (2x)(-4) = 56$$

$$\Rightarrow \quad -8x = 56$$

$$\Rightarrow \quad x = -7$$

Hence, the required point is **(–7, 0)**.

3.Find the values of y for which the distance between the points P(2, – 3) and Q(10, y) is 10 units

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. Points P (2, –3), Q (10, y) and PQ = 10 units

The distance between two points is

$$\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2} = PQ$$

$$\Rightarrow \sqrt{(10-2)^2 + (y+3)^2} = 10$$

$$\Rightarrow 64 + y^2 + 9 + 6y = 100$$

$$\Rightarrow y^2 + 6y + 73 - 100 = 0$$

$$\Rightarrow y^2 + 6y - 27 = 0$$

$$\Rightarrow y^2 + 9y - 3y - 27 = 0$$

$$\Rightarrow y(y+9) - 3(y+9) = 0$$

$$\Rightarrow (y-3)(y+9) = 0$$

$$\Rightarrow y - 3 = 0 \quad \text{or} \quad y + 9 = 0$$

$$\Rightarrow y = 3 \text{ or } -9$$

4. Find a relation between x and y such that the point (x , y) is equidistant from the points (3, 6) and (-3, 4)

4. Find a relation between x and y such that the point (x , y) is equidistant from the points (3, 6) and (-3, 4)

Points A(3, 6) and B(-3, 4) are equidistant from point P(x, y)

$$AP = BP \Rightarrow \sqrt{(x-3)^2+(y-6)^2} = \sqrt{(x+3)^2+(y-4)^2}$$

$$\Rightarrow \quad (x-3)^2 + (y-6)^2 = (x+3)^2 + (y-4)^2$$

$$\Rightarrow \quad x^2 + 9 - 6x + y^2 + 36 - 12y = x^2 + 9 + 6x + y^2 + 16 - 8y$$

$$\Rightarrow \quad -6x - 6x - 12y + 8y + 45 - 25 = 0 \Rightarrow -12x - 4y + 20 = 0$$

Dividing by – 4, we get $3x + y - 5 = 0$

5. Show that points A(7,5),B(2,3) & C(6,-7) are the vertices of a right triangle. Also find its area.

5. Show that points A(7,5),B(2,3) & C(6,-7) are the vertices of a right triangle. Also find its area.

$$AB = \sqrt{(2-7)^2+(3-5)^2} = \sqrt{25+4} = \sqrt{29}$$

$$BC = \sqrt{(6-2)^2+(-7-3)^2} = \sqrt{16+100} = \sqrt{116}$$

$$CA = \sqrt{(7-6)^2+(5+7)^2} = \sqrt{1+144} = \sqrt{145}$$

Since, $AB^2 + BC^2 = 29 + 116 = 145 = CA^2$.

$\therefore$ ΔABC is right angled at B.

$$\text{Area} = \frac{1}{2} AB \times BC$$

$$= \frac{1}{2}\sqrt{29}.\sqrt{116} = \frac{1}{2}\sqrt{29}.2.\sqrt{29} = 29.$$

HOME ASSIGNMENT Ex. 7.1.2 Q. No 6 to Q10

AHA

1.Find a point on the y-axis which is equidistant from the points A(6, 5) and B(– 4, 3.

2. If Q(0, 1) is equidistant from P(5, –3) and R(x, 6), find the values of x. Also find the distances QR and PR.

THANKING YOU

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