



# INTERMEDIATE DEPARTMENT

## Coordinate Geometry

*Hand Notes For Intermediate Department*

### Hand Notes

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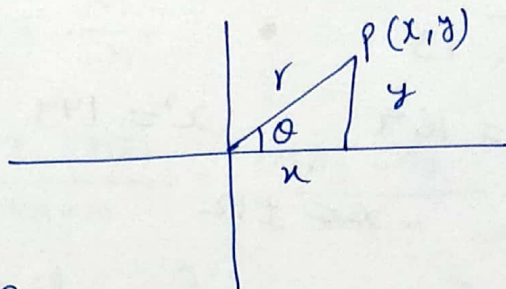
# Coordinate Geometry

①

Abscissa - x Axis

Ordinate - y Axis

Polar Coordinate of a point



$$x = r \cos \theta$$

$$y = r \sin \theta$$

$$r = \sqrt{x^2 + y^2}$$

so Polar coordinates are  $(r \cos \theta, r \sin \theta)$

Q: 1 Find Polar Coordinate of  $(1, \sqrt{3})$

$$r = \sqrt{(1)^2 + (\sqrt{3})^2} = \sqrt{1+3} = \sqrt{4}$$

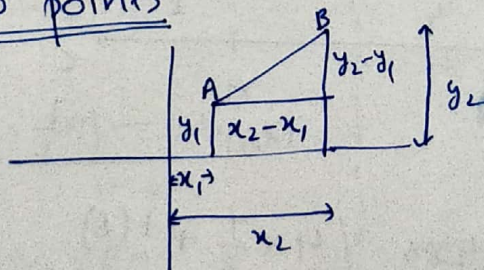
$$r = 2$$

$$\tan \theta = \frac{\sqrt{3}}{1} = \tan 60^\circ$$

$$\theta = 60^\circ$$

Polar coordinates =  $(2 \cos 60^\circ, 2 \sin 60^\circ)$

Distance between two points



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



Q.2 If the distance between two points  $(0, -5)$  and  $(x, 0)$  is 13. Find  $x$ .

$$\sqrt{(0+5)^2 + (x-0)^2} = 13$$

$$\sqrt{25+x^2} = 13$$

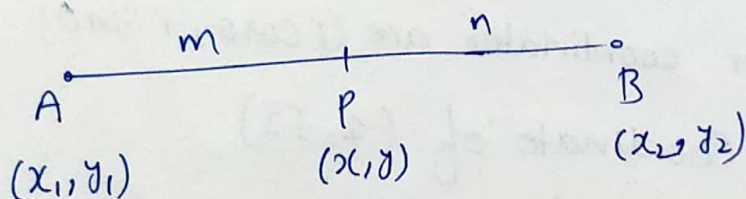
$$25+x^2 = 169$$

$$x^2 = 144$$

$$x = \pm 12$$

Section Formula (division of a line)

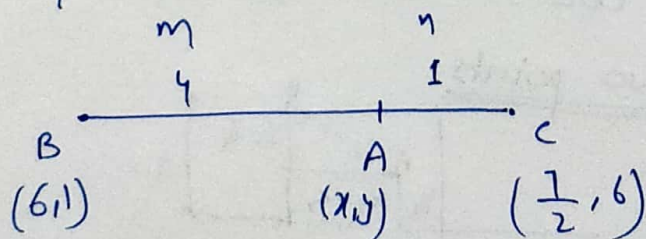
(a) Internal division



$$\frac{PA}{PB} = \frac{m}{n}$$

$$P(x, y) = \left( \frac{mx_2 + nx_1}{m+n}, \frac{my_2 + ny_1}{m+n} \right)$$

Q.3 Point A divides Segment BC in ratio 4:1 internally. Coordinates of B and C are  $(6, 1)$  and  $(\frac{7}{2}, 6)$  respectively. Find coordinates of A.



$$A(x, y) = \left( \frac{4 \times \frac{7}{2} + 1 \times 6}{4+1}, \frac{4 \times 6 + 1 \times 1}{4+1} \right)$$

$$\left( \frac{20}{5}, \frac{25}{5} \right) = (4, 5)$$