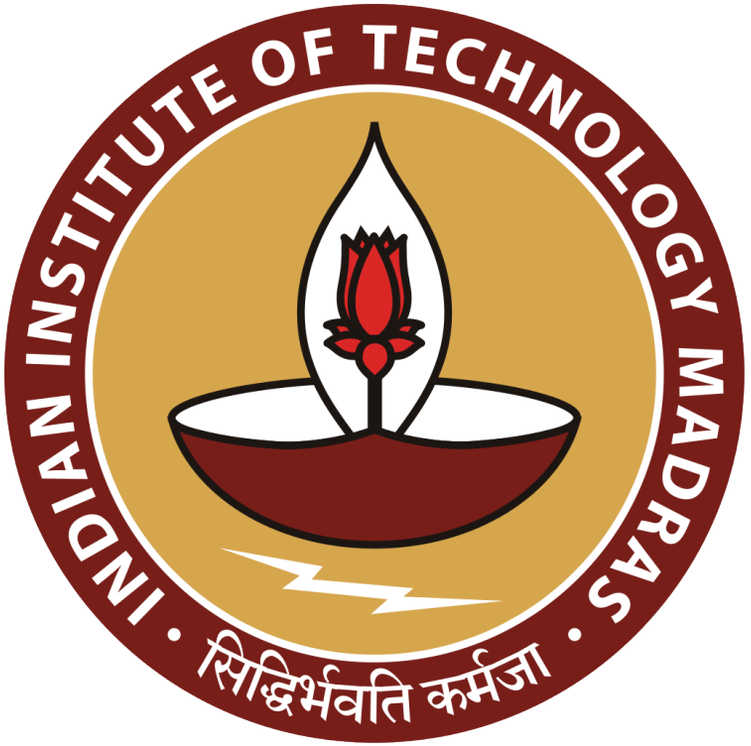
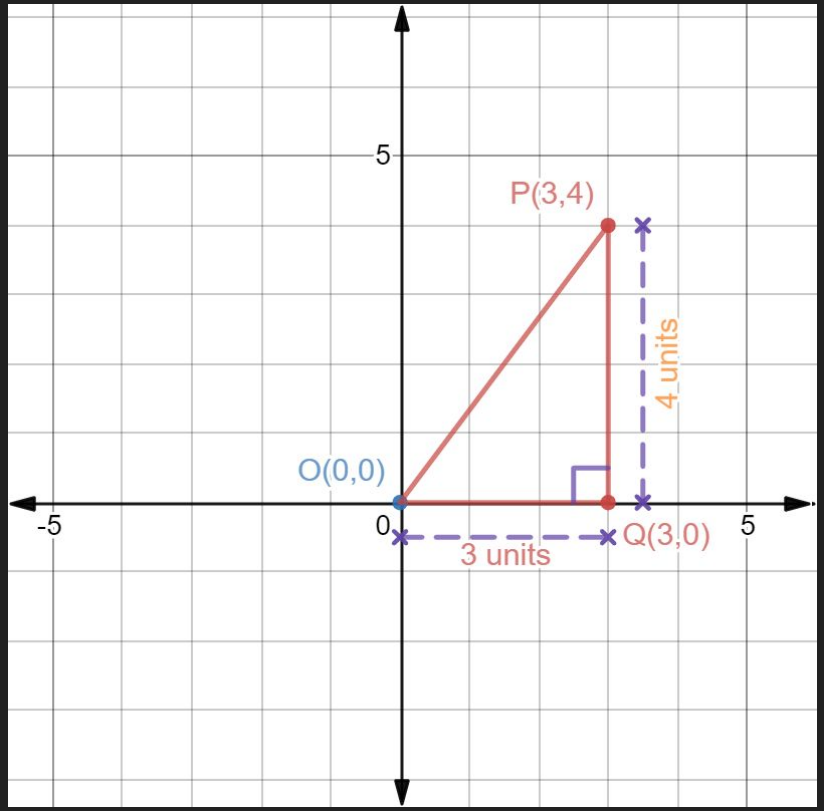


IIT Madras

ONLINE DEGREE

Distance of a Point from Origin



Goal: To find the distance of Point P (3,4) from the origin.

1. Drop a perpendicular on X-axis which intersects the X-axis at Q (3,0).
2. By Pythagorean Theorem,

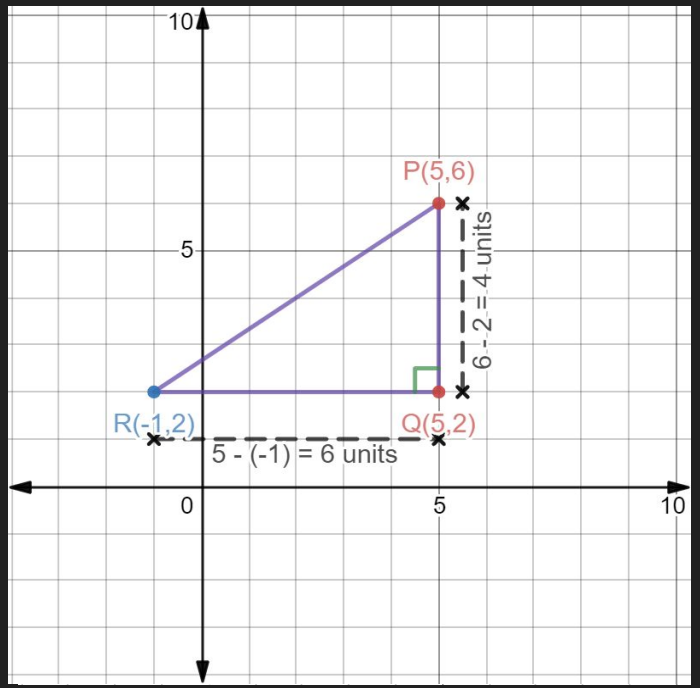
$$OP^2 = OQ^2 + QP^2$$

Hence,

$$OP = \sqrt{OQ^2 + QP^2} = \sqrt{3^2 + 4^2} = 5.$$

Distance Between Any Two Points

Goal: To find the distance between any two Points P (x_1, y_1) and R (x_2,y_2).



- Construct a right-angled triangle with right angle at Point Q (x_1, y_2).
- By Pythagorean Theorem,

$$PR^2 = QR^2 + PQ^2.$$

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

$$= \sqrt{6^2 + 4^2} = \sqrt{52} = 2\sqrt{13}.$$