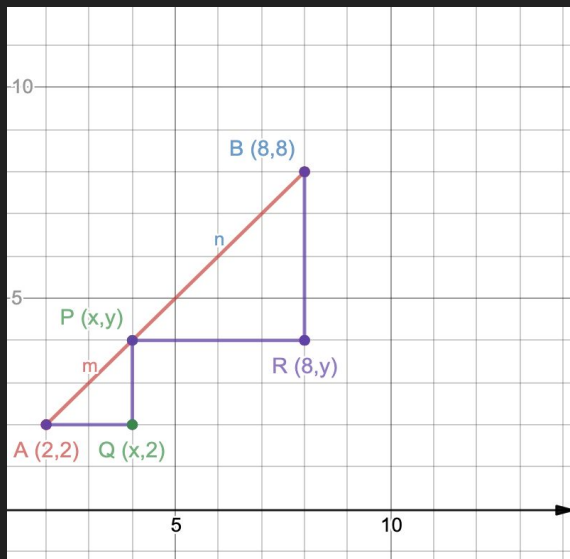# IIT Madras

ONLINE DEGREE

Section Formula

Given that, the Point P cuts the line segment AB in the *m:n* ratio. Our goal is to find the coordinates of P.

Let the Coordinates of A and B are (x_1,y_1) and (x_2,y_2), respectively. Assume that P has the coordinates (x,y).

Observe that $\triangle AQP \sim \triangle PRB$. Hence,

$$\frac{m}{n} = \frac{AP}{PB} = \frac{AQ}{PR} = \frac{PQ}{BR}$$

$$\frac{m}{n} = \frac{x-x_1}{x_2-x} = \frac{y-y_1}{y_2-y}$$

$$x = \frac{mx_2+nx_1}{m+n}, y = \frac{my_2+ny_1}{m+n}$$

B (8,8)

n

P (x,y)

m

R (8,y)

A (2,2)   Q (x,2)