

NCERT Exemplar Solutions by Dev Anoop (Bathinda), Ex. 7.3

② let line $2x + 3y - 5 = 0$ and line segment AB intersect at $P(x, y)$

let $AP : PB = k : 1$

$$x = \frac{2k + 8}{k + 1}, \quad y = \frac{k - 9}{k + 1}$$

$\therefore P(x, y)$ lies on $2x + 3y - 5 = 0$

$$\therefore 2\left(\frac{2k + 8}{k + 1}\right) + 3\left(\frac{k - 9}{k + 1}\right) = 5$$

$\times (k + 1)$

$$4k + 16 + 3k - 27 = 5k + 5$$

$$\Rightarrow 2k = 5 + 11$$

$$\Rightarrow k = \frac{16}{2}$$

$$\Rightarrow k = 8$$

$$\therefore AP : PB = 8 : 1$$

$$x = \frac{2 \times 8 + 8}{8 + 1}, \quad y = \frac{8 - 9}{8 + 1}$$

$$= \frac{24}{9} \qquad = -\frac{1}{9}$$

$$= \frac{8}{3}$$

$$\therefore P\left(\frac{8}{3}, -\frac{1}{9}\right)$$