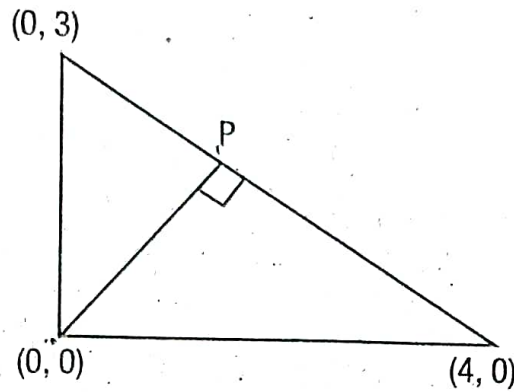
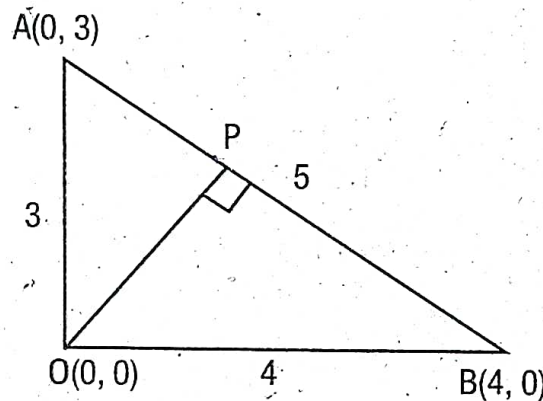


4. Calculate the coordinates of the point P in the picture.



$$AO = 3 - 0 = 3$$

$$BO = 4 - 0 = 4$$



$$AB = \sqrt{(4-0)^2 + (0-3)^2} = \sqrt{16+9} = \sqrt{25} = 5$$

$\triangle AOB$  is a right triangle.

Since the line  $OP$  is perpendicular to  $AB$ ,  $\triangle APO$  and  $\triangle OPB$  are also right triangles. Since the angles of these three triangles are equal, they are similar. In similar triangles  $\triangle APO$  and  $\triangle AOB$ , the sides are proportional.

$$\text{So } \frac{AO}{AP} = \frac{AB}{AO}$$

$$\frac{3}{AP} = \frac{5}{3}, \quad 5AP = 9, \quad AP = \frac{9}{5} \text{ units}$$

$$AB = 5, \quad AP = \frac{9}{5}$$

$$\text{so } PB = 5 - \frac{9}{5} = \frac{25}{5} - \frac{9}{5} = \frac{16}{5}$$

$$\therefore AP : PB = \frac{9}{5} : \frac{16}{5} = 9 : 16$$

Moving from  $(0, 3)$  to  $(4, 0)$  the  $x$  coordinate increases by 4 and the  $y$  coordinate decreases by 3.