Exercise 11.1 Page No: 11.4

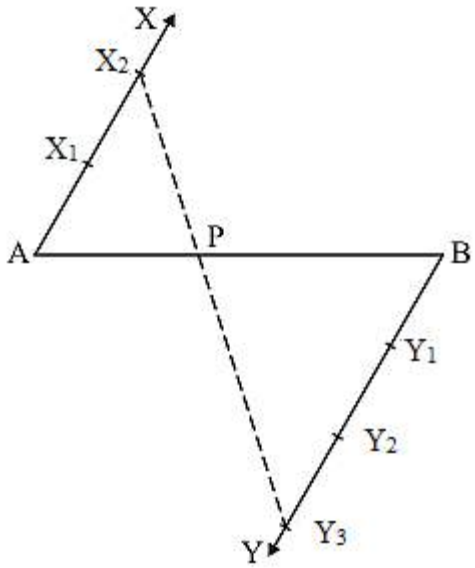
1. Determine a point which divides a line segment of length 12 cm internally in the ratio of 2: 3. Also, justify your construction.

Solution:

Steps of construction:

1. Draw a line segment AB = 12 cm by using a ruler.
2. Through the points A and B draw two parallel line on the opposite side of AB and making the same acute angles with the line segment.
3. Cut 2 equal parts on AX and 3 equal parts on BY such that $AX_1 = X_1X_2$ and $BY_1 = Y_1Y_2 = Y_2Y_3$.
4. Join X_2Y_3 which intersects AB at P

Hence, AP/PB = 2/3.



Justification:

In ΔAX_2P and ΔBY_3P, we have

$\angle APX_2 = \angle BPY_3$ [vertically opposite angle]

$\angle X_2AP = \angle Y_3BP$ [alternate interior angles}

$\Delta AX_2P = \Delta BY_3P$ [Because AA similarity]

$\therefore$ $AP/BP = AX_2/BY_3 = 2/3$ [From C.P.C.T]