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AI24BTECH11025 - PEDAPROLU LAKSHMI KUSHAL

Question:

Find the ratio in which the point $P\left(\frac{3}{4}, \frac{5}{12}\right)$ divides the line segment joining the points $A\left(\frac{1}{2}, \frac{3}{2}\right)$ and $B(2, -5)$.

Solution:

To find the ratio $m : n$ in which the point $P\left(\frac{3}{4}, \frac{5}{12}\right)$ divides the line segment joining the

Variable	Description	Value
A	Point A coordinates	$\left(\frac{1}{2}, \frac{3}{2}\right)$
B	Point B coordinates	$(2, -5)$
P	Point P coordinates	$\left(\frac{3}{4}, \frac{5}{12}\right)$
m	Ratio part for point B	5
n	Ratio part for point A	1
Ratio	Ratio in which point P divides line segment AB	5 : 1

TABLE 0: Variables Used

points $A\left(\frac{1}{2}, \frac{3}{2}\right)$ and $B(2, -5)$, we use the section formula.

Let the ratio be $m : n$.

$$\left(\frac{m \cdot x_2 + n \cdot x_1}{m + n}, \frac{m \cdot y_2 + n \cdot y_1}{m + n}\right) \quad (0.1)$$

$$\left(\frac{m \cdot 2 + n \cdot \frac{1}{2}}{m + n}, \frac{m \cdot (-5) + n \cdot \frac{3}{2}}{m + n}\right) = \left(\frac{3}{4}, \frac{5}{12}\right) \quad (0.2)$$

$$\frac{m \cdot 2 + n \cdot \frac{1}{2}}{m + n} = \frac{3}{4} \quad (0.3)$$

$$\frac{m \cdot (-5) + n \cdot \frac{3}{2}}{m + n} = \frac{5}{12} \quad (0.4)$$

$$m \cdot 8 + n \cdot 2 = m \cdot 3 + n \cdot 3$$

Hence, the answer is **1:5**.

