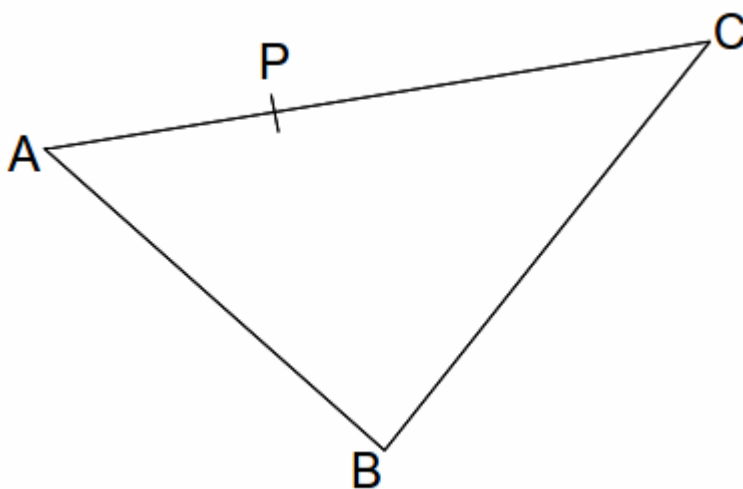


Working With Column Vectors

Writing vectors as column vectors is more informative than using vector notation since more information is included, and is preferable when working in the $x - y$ plane. Suppose we have the triangle below.



P splits AC in the ratio 1:2. The vector from A to B is $\vec{AB} = \begin{pmatrix} 2 \\ -1 \end{pmatrix}$ and the vector from B to C is $\vec{BC} = \begin{pmatrix} 3 \\ 3 \end{pmatrix}$.

Then
$$\vec{AC} = \vec{AB} + \vec{BC} = \begin{pmatrix} 2 \\ -1 \end{pmatrix} + \begin{pmatrix} 3 \\ 3 \end{pmatrix} = \begin{pmatrix} 5 \\ 2 \end{pmatrix}.$$

$$\vec{AP} = \frac{1}{3} \vec{AC} = \begin{pmatrix} 5/3 \\ 2/3 \end{pmatrix}$$

and
$$\vec{BP} = -\vec{AB} + \vec{AP} = -\begin{pmatrix} 2 \\ -1 \end{pmatrix} + \begin{pmatrix} 5/3 \\ 2/3 \end{pmatrix} = \begin{pmatrix} -2+5/3 \\ 1+2/3 \end{pmatrix} = \begin{pmatrix} -1/3 \\ 5/3 \end{pmatrix}$$