

Start:

$$A = (4, -3)$$

$$B = (5, -1)$$

$$C = (-1, -2)$$

$$\vec{AB} =$$

$\vec{CA} =$	$\begin{pmatrix} -5 \\ 1 \end{pmatrix}$	$\vec{AC} =$	$\begin{pmatrix} -6 \\ -1 \end{pmatrix}$	$\vec{BC} =$	$\begin{pmatrix} 1 \\ 2 \end{pmatrix}$
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$$\begin{pmatrix} 5 \\ -1 \end{pmatrix}$$

$$\vec{CB} =$$

$\begin{pmatrix} 6 \\ 1 \end{pmatrix}$	$\vec{BA} =$	$\begin{pmatrix} -1 \\ -2 \end{pmatrix}$	magnitude of $\vec{AB} =$	$\sqrt{5}$	magnitude of $\vec{AC} =$
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$$\sqrt{26}$$

$$\text{magnitude of } \vec{BC} =$$

A vector perpendicular to $\vec{AC} =$	$\begin{pmatrix} 1 \\ -6 \end{pmatrix}$	A vector perpendicular to $\vec{BC} =$	$\begin{pmatrix} -2 \\ 1 \end{pmatrix}$	A vector perpendicular to $\vec{AB} =$	$\sqrt{37}$
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$$\begin{pmatrix} 1 \\ 5 \end{pmatrix}$$

the cosine of the acute angle between AB and BC =

The position vector of the mid - point of the line AB =	$\frac{3}{\sqrt{130}}$	the cosine of the acute angle between AB and AC =	$\frac{29}{\sqrt{962}}$	the cosine of the acute angle between AC and BC =	$\frac{8}{\sqrt{185}}$
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$$\begin{pmatrix} 4.5 \\ -2 \end{pmatrix}$$

The position vector of the mid - point of the line AC =

$\begin{pmatrix} 1.5 \\ -2.5 \end{pmatrix}$	The position vector of the mid - point of the line BC =	$\begin{pmatrix} 2 \\ -1.5 \end{pmatrix}$	The position vector of the point which divides the line BC in the ratio 1:2 =	$\begin{pmatrix} 3 \\ -\frac{4}{3} \end{pmatrix}$	The position vector of the point which divides the line AB in the ratio 2:1 =
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$$\begin{pmatrix} \frac{14}{3} \\ -\frac{5}{3} \end{pmatrix}$$

The position vector of the point which divides the line BC in the ratio 2:3 =

<i>Finish</i>	$\begin{pmatrix} \frac{1}{4} \\ -\frac{9}{4} \end{pmatrix}$	The position vector of the point which divides the line CA in the ratio 1:3 =	$\begin{pmatrix} \frac{7}{3} \\ -\frac{8}{3} \end{pmatrix}$	The position vector of the point which divides the line AC in the ratio 1:2 =	$\begin{pmatrix} \frac{13}{5} \\ -\frac{7}{5} \end{pmatrix}$
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