Question	Answer	Marks	Guidance
1	$\begin{pmatrix}10\\5\\-5\end{pmatrix} = \lambda\begin{pmatrix}3\\2\\-1\end{pmatrix} + \mu\begin{pmatrix}-1\\1\\2\end{pmatrix}$	M1	required form, can be soi from two or more correct equations
	$\Rightarrow \quad 3\lambda - \mu = 10$	M1	forming at least two equations and attempting to solve oe
	$2\lambda + \mu = 5 \Rightarrow 5\lambda = 15, \quad \lambda = 3$	A1	w
	$\Rightarrow \quad 9 - \mu = 10, \ \mu = -1$	A1	w
	$-5 = -\lambda + 2\mu$, $\quad -5 = -3 + 2 \times -1$ true	A1	verifying third equation, **do not** give BOD accept a statement such as $\begin{pmatrix}10\\5\\-5\end{pmatrix} = 3\begin{pmatrix}3\\2\\-1\end{pmatrix} + -1\begin{pmatrix}-1\\1\\2\end{pmatrix}$ as verification Must **clearly** show that the solutions satisfy all the equations.
	coplanar		oe **independent** of all above marks
		[6]	

2 $4\mathbf{j} - 3\mathbf{k} = \lambda\,\mathbf{a} + \mu\,\mathbf{b}$ $= \lambda(2\mathbf{i} + \mathbf{j} - \mathbf{k}) + \mu(4\mathbf{i} - 2\mathbf{j} + \mathbf{k})$ $\Rightarrow \quad 0 = 2\lambda + 4\mu$ $4 = \lambda - 2\mu$ $-3 = -\lambda + \mu$ $\Rightarrow \quad \lambda = -2\mu,\ 2\lambda = 4 \Rightarrow \lambda = 2,\ \mu = -1$	M1 M1 A1 A1, A1 [5]	equating components at least two correct equations

3 $\overrightarrow{BA} = \begin{pmatrix} -4 \\ 1 \\ -3 \end{pmatrix}$, $\overrightarrow{BC} = \begin{pmatrix} 2 \\ 5 \\ -1 \end{pmatrix}$	B1	soi , condone wrong sense
$\overrightarrow{BA}.\overrightarrow{BC} = \begin{pmatrix} -4 \\ 1 \\ -3 \end{pmatrix}.\begin{pmatrix} 2 \\ 5 \\ -1 \end{pmatrix} = (-4)\times 2 + 1\times 5 + (-3)\times(-1)$	M1	scalar product
$= -8 + 5 + 3 = 0$ $\Rightarrow$ angle ABC = 90°	A1	= 0
Area of triangle = ½ × BA × BC $= \frac{1}{2}\times\sqrt{(-4)^2 + 1^2 + 3^2}\times\sqrt{2^2 + 5^2 + -1)^2}$ = ½ × √26 × √30 = 13.96 sq units	M1 M1 A1 [6]	area of triangle formula oe length formula accept 14.0 and √195