

Question	Scheme	Marks	AOs
7	Attempts $\overrightarrow{AC} = \overrightarrow{AB} + \overrightarrow{BC} = 2\mathbf{i} + 3\mathbf{j} + \mathbf{k} + \mathbf{i} - 9\mathbf{j} + 3\mathbf{k} = 3\mathbf{i} - 6\mathbf{j} + 4\mathbf{k}$	M1	3.1a
	Attempts to find any one length using 3-d Pythagoras	M1	2.1
	Finds all of $ AB = \sqrt{14}$, $ AC = \sqrt{61}$, $ BC = \sqrt{91}$	A1ft	1.1b
	$\cos BAC = \frac{14 + 61 - 91}{2\sqrt{14}\sqrt{61}}$	M1	2.1
	angle $BAC = 105.9^\circ$ *	A1*	1.1b
		(5)	

(5 marks)

Notes:

M1: Attempts to find \overrightarrow{AC} by using $\overrightarrow{AC} = \overrightarrow{AB} + \overrightarrow{BC}$

M1: Attempts to find any one length by use of Pythagoras' Theorem

A1ft: Finds all three lengths in the triangle. Follow through on their $|AC|$

M1: Attempts to find BAC using $\cos BAC = \frac{|AB|^2 + |AC|^2 - |BC|^2}{2|AB||AC|}$

Allow this to be scored for other methods such as $\cos BAC = \frac{\overrightarrow{AB} \cdot \overrightarrow{AC}}{|AB||AC|}$

A1*: This is a show that and all aspects must be correct. Angle $BAC = 105.9^\circ$