

Question Number	Scheme	Marks
<b>3(a)</b>	$AM = \sqrt{6^2 + 8^2} = 10$ $AE = \sqrt{14^2 + 10^2} = \sqrt{296} = 17.20... = 17.2 \text{ cm}$	M1 M1A1 (3)
<b>(b)</b>	$\tan \phi = \frac{EM}{MA} = \frac{14}{10}, \phi = 54.46... = 54.5^\circ$ or using another trig function	M1A1ft,A1(3)
<b>(c)</b>	$\tan \theta = \frac{EM}{\frac{1}{2}CD} = \frac{14}{8}, \theta = 60.255...^\circ = 60.3^\circ$	M1A1ft,A1 (3) [9]

Part	Mark	Notes
(a)	M1	Applies Pythagoras theorem to find the length of $AM$ $AM = \sqrt{6^2 + 8^2} = 10$ or $AM = \frac{\sqrt{12^2 + 16^2}}{2} = 10$
	M1	Applies Pythagoras to find the length of one of the sloping edges $AE = \sqrt{14^2 + 10^2} = \sqrt{296} = ...$
	A1	For the correct length of either $AE$ , $DE$ , $CE$ or $BE$ $AE = 17.2 \text{ cm}$ rounded correctly
	<b>ALT</b>	
	M1M1	Applies Pythagoras in 3D $AE = \sqrt{14^2 + 6^2 + 8^2} = \sqrt{296} = ...$
(b)	M1	For applying any acceptable trigonometry to find the required angle. $\tan \phi = \frac{EM}{MA} = \frac{14}{10}$ , or $\sin \phi = \frac{14}{\sqrt{296}}$ , or $\cos \phi = \frac{10}{\sqrt{296}} \Rightarrow \phi = ...$
	A1ft	For the correct trigonometry if they use sine or cosine following through their $\sqrt{296}$
	A1	Required angle = $54.5^\circ$ Rounded correctly
(c)	M1	For applying trigonometry to find the required angle. $\tan \theta = \frac{EM}{\frac{1}{2}CD} = \frac{14}{8} \Rightarrow \theta = ...$ OR The length of the perpendicular from $E$ to the mid-point of $AD$ is $\sqrt{260}$ $\sin \theta = \left( \frac{14}{\sqrt{260}} \right)$ , or $\cos \left( \frac{8}{\sqrt{260}} \right) \Rightarrow \theta = ...$
	A1ft	Ft their $\sqrt{260}$
	A1	$\theta = 60.3^\circ$
<b>Rounding:</b> Penalise rounding only the first time it occurs in either (b) or (c)		

**USEFUL SKETCH**