

Question	Answer	Marks	Guidance
	Use correct $\cos(A - B)$ formula to obtain an equation in $\cos \theta$ and $\sin \theta$	B1	$\cos \theta \cos 60 + \sin \theta \sin 60 = 3 \sin \theta$
	Use trigonometric formula and substitute values for $\cos 60$ and $\sin 60$ to obtain an equation in $\tan \theta$ (or $\cos \theta$ or $\sin \theta$)	M1	Allow $\frac{1}{2}$ and $\frac{\sqrt{3}}{2}$ interchanged. $\frac{1}{2} + \frac{\sqrt{3}}{2} \tan \theta = 3 \tan \theta$ $\frac{1}{4} \cos^2 \theta = \left(3 - \frac{\sqrt{3}}{2}\right) \left(3 - \frac{\sqrt{3}}{2}\right) (1 - \cos^2 \theta)$ $\frac{1}{4} (1 - \sin^2 \theta) = \left(3 - \frac{\sqrt{3}}{2}\right) \left(3 - \frac{\sqrt{3}}{2}\right) \sin^2 \theta$
	Obtain $\tan \theta = \frac{1}{6 - \sqrt{3}}$ or $\tan \theta = \frac{6 + \sqrt{3}}{33}$ or 0.2343, $\cos \theta = \frac{3 \frac{\sqrt{3}}{2}}{\sqrt{10 - 3\sqrt{3}}}$ or 0.9736 or $\sin \theta = \frac{\frac{1}{2}}{\sqrt{10 - 3\sqrt{3}}}$ or 0.2281	A1	OE
	Obtain answer, e.g. $\theta = 13.2^\circ$	A1	May be more accurate, allow value rounding to 13.2° . $\theta = 13.1867^\circ$.
	Obtain second answer, e.g. $\theta = 193.2^\circ$ and no others in the given interval	A1 FT	May be more accurate. Allow value rounding to 193.2° . FT is on previous value of θ , must have scored M1. Note if θ is negative (e.g. -13.2): $-13.2 + 180 = 166.8$ A0 but $-13.2 + 360 = 346.8$ A1 FT. Ignore answers outside the given interval. Treat answers in radians as a misread. 0.23015, 3.3717.

Question	Answer	Marks	Guidance
	Alternative method for question – using $R\cos(\theta \pm \alpha)$ or equivalent		
	Use correct $\cos(A - B)$ formula to obtain an equation in $\cos \theta$ and $\sin \theta$	B1	$\cos \theta \cos 60 + \sin \theta \sin 60 = 3 \sin \theta$
	Correct method for finding $\tan \alpha$ from $p\cos \theta + q\sin \theta = 0$	M1	$\tan \alpha = \pm \frac{q}{p}$
	Correct value of α	A1	76.8° or 1.34 radians (may be more accurate).
	Obtain answer, e.g. $\theta = 13.2^\circ$	A1	May be more accurate, allow value rounding to 13.2° . $\theta = 13.1867^\circ$.
	Obtain second answer, e.g. $\theta = 193.2^\circ$ and no others in the given interval	A1 FT	May be more accurate. Allow value rounding to 193.2° . FT is on previous value of θ , must have scored M1. Note if θ is negative (e.g. -13.2): $-13.2 + 180 = 166.8$ A0 but $-13.2 + 360 = 346.8$ A1 FT. Ignore answers outside the given interval. Treat answers in radians as a misread. 0.23015, 3.3717.
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