

| Question | | | Answer | Marks | AO | Guidance |
|----------|--|--|---|-------|-----|--|
| 1 | | | $R^2 = 1^2 + \sqrt{3}^2$ | M1 | 1.1 | may be implied by correct answer |
| | | | $\tan\alpha = \frac{\sqrt{3}}{1}$ or $\sin\alpha = \frac{\sqrt{3}}{2}$ or $\cos\alpha = \frac{1}{2}$ soi | M1 | 1.1 | may see eg $\alpha = \tan^{-1}\left(\frac{\sqrt{3}}{1}\right)$ may be implied by correct answer |
| | | | $R = 2$ or $\alpha = \frac{\pi}{3}$ or $\alpha = 60^\circ$ seen | A1 | 1.1 | |
| | | | $2\cos\left(\theta - \frac{\pi}{3}\right)$ or $2\cos(\theta - 60^\circ)$ isw | A1 | 1.1 | |
| | | | | [4] | | |
| | | | <p><i>Alternatively</i></p> $\cos\theta + \sqrt{3}\sin\theta = R\cos\theta\cos\alpha + R\sin\theta\sin\alpha$ <p>so $1 = R\cos\alpha$ and $\sqrt{3} = R\sin\alpha$</p> $\frac{1}{\cos\alpha} = \frac{\sqrt{3}}{\sin\alpha}$ $\alpha = \frac{\pi}{3}$ or $\alpha = 60^\circ$ seen $2\cos\left(\theta - \frac{\pi}{3}\right)$ or $2\cos(\theta - 60^\circ)$ isw | M1 | | for equating coefficients |
| | | | | M1 | | for eliminating R |
| | | | | A1 | | |
| | | | | A1 | | |