

Solutions

Each answer shows the steps, then the **result**.

2.1

- $\cos 2\theta = 2 \cos^2 \theta - 1$

2.2

- $R = \sqrt{7^2 + 24^2} = 25$

3.1 B

- $2 \times \frac{3}{5} \times \frac{4}{5} = \frac{24}{25}$

3.2

(a)

- $R = \sqrt{4^2 + 3^2} = 5$; $\tan \alpha = \frac{3}{4} \Rightarrow \alpha = 36.9^\circ$; $5 \sin(\theta - 36.9^\circ)$

(b)

- $\sin(\theta - 36.9^\circ) = 0.4 \Rightarrow \theta - 36.9^\circ = 23.6^\circ \text{ or } 156.4^\circ$; $\theta = 60.5^\circ \text{ or } 193.3^\circ$

3.3

- $\sin 2\theta = 2 \sin \theta \cos \theta$ and $1 + \cos 2\theta = 2 \cos^2 \theta$; $\text{ratio} = \frac{2 \sin \theta \cos \theta}{2 \cos^2 \theta} = \frac{\sin \theta}{\cos \theta} = \tan \theta$