

3 (a) Express $3\sqrt{2}\sin(x+45^\circ) + \cos x$ in the form $R\cos(x-\alpha)$, where $R > 0$ and $0^\circ < \alpha < 90^\circ$. [4]

(b) Hence solve the equation $3\sqrt{2}\sin(3\theta+45^\circ)+\cos 3\theta=-4$ for $0^\circ < \theta < 180^\circ$.

[4]

- 7 (a) Express $5 \sin\left(x + \frac{\pi}{6}\right) - 4 \cos x$ in the form $R \sin(x - \alpha)$, where $R > 0$ and $0 < \alpha < \frac{1}{2}\pi$. State the exact value of R and give the value of α correct to 3 decimal places. [4]

- (b) Hence solve the equation $5 \sin\left(2\theta + \frac{1}{6}\pi\right) - 4 \cos 2\theta = \sqrt{7}$ for $0 \leq \theta \leq \pi$. Give your answers correct to 2 decimal places. [4]

[6]

⑤

[3]

⑥

[4]

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