

- (i) Given that $\sin(\theta + 45^\circ) + 2 \cos(\theta + 60^\circ) = 3 \cos \theta$, find the exact value of $\tan \theta$ in a form involving surds. You need not simplify your answer. [4]
- (ii) Hence solve the equation $\sin(\theta + 45^\circ) + 2 \cos(\theta + 60^\circ) = 3 \cos \theta$ for $0^\circ < \theta < 360^\circ$. [2]