Section 2: Further trigonometric equations

Exercise level 1

1. Solve the following equations for $0° \le x \le 360°$.
   (i) $3\sin(\theta + 20°) = 2$
   (ii) $4\cos(\theta + 50°) = 1$
   (iii) $7\sin(\theta - 35°) = 5$
   (iv) $5\cos(\theta - 62°) = 3$

2. (i) Given that $2\sin\theta + 3\cos\theta = R\sin(\theta + \alpha)$, show that $R\cos\alpha = 2$ and $R\sin\alpha = 3$.
   (ii) Hence find the values of R and α , given that $R > 0$ and $0° < \alpha < 90°$.

3. (i) Given that $\sin\theta - 4\cos\theta = R\sin(\theta - \alpha)$, show that $R\cos\alpha = 1$ and $R\sin\alpha = 4$.
   (ii) Hence find the values of R and α , given that $R > 0$ and $0° < \alpha < 90°$.

4. (i) Given that $4\cos\theta - 5\sin\theta = R\cos(\theta + \alpha)$, show that $R\cos\alpha = 4$ and $R\sin\alpha = 5$.
   (ii) Hence find the values of R and α , given that $R > 0$ and $0° < \alpha < 90°$.

5. (i) Given that $3\sin\theta + \cos\theta = R\cos(\theta - \alpha)$, show that $R\cos\alpha = 1$ and $R\sin\alpha = 3$.
   (ii) Hence find the values of R and α , given that $R > 0$ and $0° < \alpha < 90°$.