The Addition Formulae

Specification: AQA 7357: E6, E8 · Edexcel 9MA0: 5.6, 5.8

HOMEWORK Consolidation

1 Write $\sin(x - 30°)$ in the form $p \sin x + q \cos x$.
AQA E6 · Edexcel 5.6

2 Write $\cos(2x + 60°)$ in the form $p \cos 2x + q \sin 2x$.
AQA E6 · Edexcel 5.6

3 Write $\sin 5x \cos x - \cos 5x \sin x$ as a single trig ratio.
AQA E6 · Edexcel 5.6

4 Without a calculator, find the exact value of $\cos 100° \cos 40° + \sin 100° \sin 40°$.
AQA E6 · Edexcel 5.6

5 Without a calculator, find the exact value of $\dfrac{\tan 70° - \tan 25°}{1 + \tan 70° \tan 25°}$.
AQA E6 · Edexcel 5.6

6 Write $\tan(x + 60°)$ in terms of $\tan x$.
AQA E6 · Edexcel 5.6

7 Show that $\cos(x - 90°) \equiv \sin x$.
AQA E6, E8 · Edexcel 5.6, 5.8

8 By choosing values of A and B, show that $\tan(A + B) \equiv \tan A + \tan B$ is false.
AQA E6 · Edexcel 5.6

9 Show that $\dfrac{\sin(A + B)}{\sin A \sin B} \equiv \cot A + \cot B$.
AQA E6, E8 · Edexcel 5.6, 5.8

10 Show that $\cos(\theta + 120°) + \cos(\theta - 120°) \equiv -\cos\theta$.
AQA E6, E8 · Edexcel 5.6, 5.8

11 *AQA-style*.

(a) Show that $\sin(x + \frac{\pi}{3}) - \sin(x - \frac{\pi}{3}) \equiv \sqrt{3} \cos x$. [3 marks]

(b) Hence solve $\sin(x + \frac{\pi}{3}) - \sin(x - \frac{\pi}{3}) = 1.5$ for $0 \leq x < 2\pi$. Give exact answers. [3 marks]

AQA E6, E7 · Edexcel 5.6, 5.7 · AQA-style

12 *Edexcel-style*.

(a) Starting from the formulae for $\sin(A + B)$ and $\cos(A + B)$, prove that $\tan(A + B) \equiv \dfrac{\tan A + \tan B}{1 - \tan A \tan B}$. [4 marks]

(b) Hence show that $\tan(\theta + \frac{\pi}{4}) \equiv \dfrac{1 + \tan\theta}{1 - \tan\theta}$. [2 marks]

AQA E6, E8 · Edexcel 5.6, 5.8 · Edexcel-style