Double-Angle Formulae

Specification: AQA 7357: E6, E5 · Edexcel 9MA0: 5.6, 5.5

HOMEWORK Consolidation

1 Write $10\sin 4x\cos 4x$ in the form $a\sin bx$.

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2 Find the exact value of $\cos^2\frac{\pi}{12} - \sin^2\frac{\pi}{12}$.

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3 Find the exact value of $2\cos^2 75° - 1$.

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4 $\sin x = \frac{2}{3}$ and x is obtuse. Find the exact values of $\sin 2x$ and $\cos 2x$.

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5 $\tan A = \frac{1}{2}$. Find the exact value of:

(a) $\tan 2A$

(b) $\tan 4A$

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6 Eliminate θ: $x = 5\cos\theta, y = \cos 2\theta$.

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7 Show that $(\cos x - \sin x)^2 \equiv 1 - \sin 2x$.

AQA E8, E5 · Edexcel 5.8, 5.5

8 Show that $\frac{\sin 2x}{1+\cos 2x} \equiv \tan x$.

AQA E8, E5 · Edexcel 5.8, 5.5

9 $\cos 2A = -\frac{7}{25}$ and A is acute. Find the exact values of $\sin A$ and $\cos A$.

AQA E6 · Edexcel 5.6

10 Show that $\cos 2\theta \equiv \frac{1-\tan^2\theta}{1+\tan^2\theta}$.

AQA E8, E5 · Edexcel 5.8, 5.5

11 *AQA-style*.

(a) Show that $2\sin x\cos x(\cos^2 x - \sin^2 x) \equiv \frac{1}{2}\sin 4x$. [3 marks]

(b) Hence find the exact value of $2\sin\frac{\pi}{24}\cos\frac{\pi}{24}(\cos^2\frac{\pi}{24} - \sin^2\frac{\pi}{24})$. [2 marks]

AQA E6 · Edexcel 5.6 · AQA-style

12 *Edexcel-style*.

(a) Use the identity $\cos(A+B) \equiv \cos A\cos B - \sin A\sin B$ to show that $\cos 2A \equiv 2\cos^2 A - 1$. [2 marks]

(b) Hence show that $\cos^2 x \equiv \frac{1}{2}(1+\cos 2x)$. [1 mark]

(c) Given that $\cos x = 0.6$ and x is acute, find the exact value of $\cos\frac{x}{2}$. [3 marks]

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