

A2.A.77: Double Angle Identities 2: Apply the double-angle and half-angle formulas for trigonometric functions

- 1 The expression $\cos^2 \theta - \cos 2\theta$ is equivalent to
- 2 The expression $\sin 2A - 2 \sin A$ is equivalent to
- 3 The expression $\sin 2A + \cos A$ is equivalent to
- 4 The expression $\sin A \cos A + \sin 2A$ is equivalent to
- 5 The expression $2 \sin^2 A + \cos 2A$ is equivalent to
- 6 The expression $\frac{\sin 2A}{2 \cos A}$ is equivalent to
- 7 The expression $\frac{2 \cos \theta}{\sin 2\theta}$ is equivalent to
- 8 Which trigonometric function is equivalent to the expression $\frac{\sin 2x}{2 \sin x}$ is equivalent to
- 9 The expression $\frac{\sin 2\theta}{\sin^2 \theta}$ is equivalent to
- 10 The expression $\frac{\sin 2A}{2 \cos^2 A}$ is equivalent to
- 11 The expression $\frac{1 + \cos 2A}{\sin 2A}$ is equivalent to
- 12 For all values of A for which the expressions are defined, $\frac{\sin 2A}{\cos A} - \sin A$ is equivalent to
- 13 If θ is a positive acute angle and $\sin 2\theta = \frac{\sqrt{3}}{2}$, then $(\cos \theta + \sin \theta)^2$ equals
- 14 The expression $\sec x \sin 2x$ is equivalent to
- 15 The expression $\csc A \sin 2A$ is equivalent to
- 16 The expression $\frac{\sin 2x}{\sin(-x)}$ is equivalent to
- 17 The expression $(\sin x - \cos x)^2$ is equivalent to

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Answer Section

1 ANS:

$$\sin^2 \theta$$

$$\cos^2 \theta - \cos 2\theta = \cos^2 \theta - (\cos^2 \theta - \sin^2 \theta) = \sin^2 \theta$$

REF: 061024a2

2 ANS:

$$(2 \sin A)(\cos A - 1)$$

REF: 080225siii

3 ANS:

$$\cos A(2 \sin A + 1)$$

REF: 018927siii

4 ANS:

$$3 \sin A \cos A$$

REF: 089534siii

5 ANS:

$$1$$

REF: 018429siii

6 ANS:

$$\sin A$$

$$\frac{\sin 2A}{2 \cos A} = \frac{2 \sin A \cos A}{2 \cos A} = \sin A$$

REF: 060914b

7 ANS:

$$\csc \theta$$

$$\frac{2 \cos \theta}{\sin 2\theta} = \frac{2 \cos \theta}{2 \cos \theta \sin \theta} = \frac{1}{\sin \theta} = \csc \theta$$

REF: 080315b

8 ANS:

$$\cos x$$

REF: 089720siii

9 ANS:

$$2 \cot \theta$$

$$\frac{\sin 2\theta}{\sin^2 \theta} = \frac{2 \sin \theta \cos \theta}{\sin^2 \theta} = \frac{2 \cos \theta}{\sin \theta} = 2 \cot \theta$$

REF: 080617b

10 ANS:
 $\tan A$

REF: 069523siii

11 ANS:
 $\cot A$

$$\frac{1 + \cos 2A}{\sin 2A} = \frac{1 + 2\cos^2 A - 1}{2\sin A \cos A} = \frac{\cos A}{\sin A} = \cot A$$

REF: 061522a2

12 ANS:
 $\sin A$

REF: 069024siii

13 ANS:

$$1 + \frac{\sqrt{3}}{2}$$

$$\begin{aligned} (\cos \theta + \sin \theta)^2 &= \cos^2 \theta + 2\cos \theta \sin \theta + \sin^2 \theta \\ &= (\cos^2 \theta + \sin^2 \theta) + 2\cos \theta \sin \theta \\ &= 1 + 2\cos \theta \sin \theta \\ &= 1 + \sin 2\theta = 1 + \frac{\sqrt{3}}{2} \end{aligned}$$

REF: 010609b

14 ANS:
 $2\sin x$

REF: 019924siii

15 ANS:
 $2\cos A$

REF: 060229siii

16 ANS:
 $-2\cos x$

REF: 089825siii

17 ANS:
 $1 - \sin 2x$

REF: 068126siii