A2.A.77: Double Angle Identities 1: Apply the double-angle and half-angle formulas for trigonometric functions

1 The expression $\cos^2\theta - \cos 2\theta$ is equivalent to
1) $\sin^2\theta$
2) $-\sin^2\theta$
3) $\cos^2\theta + 1$
4) $-\cos^2\theta - 1$

2 The expression $\sin 2A - 2\sin A$ is equivalent to
1) $(\sin A)(\sin A - 2)$
2) $(2\sin A)(\sin A - 1)$
3) $(\sin A)(2\cos A - 1)$
4) $(2\sin A)(\cos A - 1)$

3 The expression $\sin 2A + \cos A$ is equivalent to
1) $\cos A(2\sin A + 1)$
2) $\cos A(\cos A + 1)$
3) $2(\sin A + \cos A)$
4) $\cos A(\sin A + 1)$

4 The expression $\sin A\cos A + \sin 2A$ is equivalent to
1) $\sin A(\cos A + \sin A)$
2) $\cos A + 2\sin A$
3) $3\sin A\cos A$
4) $\cos A + 2\sin 2A$

5 The expression $2\sin^2 A + \cos 2A$ is equivalent to
1) 1
2) 2
3) $\sin^2 A$
4) $-\sin^2 A$

6 The expression $\frac{\sin 2A}{2\cos A}$ is equivalent to
1) $\cos A$
2) $\tan A$
3) $\sin A$
4) $\frac{1}{2}\sin A$

7 The expression $\frac{2\cos\theta}{\sin 2\theta}$ is equivalent to
1) $\csc\theta$
2) $\sec\theta$
3) $\cot\theta$
4) $\sin\theta$

8 Which trigonometric function is equivalent to the expression $\frac{\sin 2x}{2\sin x}$ is equivalent to
1) $\tan x$
2) $\cot x$
3) $\sin x$
4) $\cos x$

9 The expression $\frac{\sin 2\theta}{\sin^2\theta}$ is equivalent to
1) $\frac{2}{\sin\theta}$
2) $2\cos\theta$
3) $2\cot\theta$
4) $2\tan\theta$

10 The expression $\frac{\sin 2A}{2\cos^2 A}$ is equivalent to

1) $\sin A$
2) $\tan A$
3) $\cot A$
4) $2\tan A$

11 The expression $\frac{1+\cos 2A}{\sin 2A}$ is equivalent to

1) $\cot A$
2) $\tan A$
3) $\sec A$
4) $1+\cot 2A$

12 For all values of A for which the expressions are defined, $\frac{\sin 2A}{\cos A} - \sin A$ is equivalent to

1) 1
2) $\cos A$
3) $\sin A$
4) $2\sin A$

13 If θ is a positive acute angle and $\sin 2\theta = \frac{\sqrt{3}}{2}$, then $(\cos\theta + \sin\theta)^2$ equals

1) 1
2) $1+\frac{\sqrt{3}}{2}$
3) 30°
4) 60°

14 The expression $\sec x \sin 2x$ is equivalent to

1) $\frac{1}{2}$
2) 2
3) $2\cos x$
4) $2\sin x$

15 The expression $\csc A \sin 2A$ is equivalent to

1) $2\sin A$
2) 2
3) $2\cos A$
4) $2\cot A$

16 The expression $\frac{\sin 2x}{\sin(-x)}$ is equivalent to

1) $-2\sin x$
2) $2\sin x$
3) $-2\cos x$
4) $2\cos x$

17 The expression $(\sin x - \cos x)^2$ is equivalent to

1) 1
2) $-\cos 2x$
3) $1-\sin 2x$
4) $1-\cos 2x$

A2.A.77: Double Angle Identities 1: Apply the double-angle and half-angle formulas for trigonometric functions
Answer Section

1 ANS: 1

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

REF: 061024a2

2 ANS: 4 REF: 080225siii

3 ANS: 1 REF: 018927siii

4 ANS: 3 REF: 089534siii

5 ANS: 1 REF: 018429siii

6 ANS: 3

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

REF: 060914b

7 ANS: 1

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

REF: 080315b

8 ANS: 4 REF: 089720siii

9 ANS: 3

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

REF: 080617b

10 ANS: 2 REF: 069523siii

11 ANS: 1

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

REF: 061522a2

12 ANS: 3 REF: 069024siii

13 ANS: 2

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

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

$= 1 + 2\cos\theta\sin\theta$

$= 1 + \sin 2\theta = 1 + \frac{\sqrt{3}}{2}$

REF: 010609b

14 ANS: 4 REF: 019924siii

15 ANS: 3 REF: 060229siii
16 ANS: 3 REF: 089825siii
17 ANS: 3 REF: 068126siii