Name:_____ Class:_____ Date:_____

Precalculus_G11_Ch5_Test

Indicate the answer choice that best completes the statement or answers the question.

1. $\cos 2x + \frac{1}{2} = 0$

a. $\frac{\pi}{6} + 2\pi n; \frac{\pi}{3} + 2\pi n$ b. $\frac{\pi}{3} + 2\pi n; \frac{2\pi}{3} + 2\pi n$

c. $\frac{\pi}{3} + \pi n; \frac{2\pi}{3} + \pi n$ d. $\frac{\pi}{6} + \pi n; \frac{\pi}{3} + \pi n$

2. An alternating current *i* in amperes in another circuit can be found after *t* seconds using $i = 4\sin(195°t)$. Rewrite the formula in terms of the difference of two angle measures.

a. $4\sin(30°t - 225°t)$ b. $\frac{1}{4}\sin(225°t - 30°t)$

c. $\frac{1}{4}\sin(30°t - 225°t)$ d. $4\sin(225°t - 30°t)$

3. Find the exact value of $\frac{\tan 106 + \tan(-61)}{1 - \tan 106 \tan(-61)}$.

a. -1 b. 1

c. no solution d. 0

4. Which of the following are the solutions of $\tan^2 x + \sec x = 1$ on the interval [0, 2π)?

a. $\frac{2\pi}{3}, \frac{4\pi}{3}$ b. $\frac{2\pi}{3}, \frac{4\pi}{3}, 0$

c. $\frac{\pi}{3}, \frac{5\pi}{3}, 0$ d. $\frac{\pi}{3}, \frac{5\pi}{3}$

5. Solve $\sin\frac{x}{2} = \cos x$ on the interval [0, 2π).

a. $\frac{\pi}{3}, \frac{5\pi}{3}$ b. $\pi, \frac{\pi}{6}, \frac{11\pi}{6}$

c. $\pi, \frac{\pi}{3}, \frac{5\pi}{3}$ d. $\frac{\sqrt{2}}{2}$

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6. Simplify $\frac{\tan^2 x - 1}{1 - \sec^2 x}$.

a. $\cot^2 x + 1$ b. $\cot^2 x - 1$
c. $1 - \cot^2 x$ d. cannot be simplified

7. Find the exact value of $\sin\frac{5\pi}{12} + \sin\frac{\pi}{12}$.

a. $-\frac{\sqrt{2}}{2}$ b. $-\frac{\sqrt{6}}{2}$
c. $\frac{\sqrt{2}}{2}$ d. $\frac{\sqrt{6}}{2}$

8. Rewrite $\sin 9x \cos 8x$as a sum or difference.

a. $\frac{1}{2}\left[\sin(17x) + \cos(x)\right]$ b. $\frac{1}{2}\left[\sin(17x) - \sin(17x)\right]$
c. $\frac{1}{2}\left[\sin(17x) + \sin(x)\right]$ d. $\frac{1}{2}\left[\sin(17x) - \sin(x)\right]$

9. Verify which of the following are trigonometric identities.

1) $1 + \frac{\cos^2\theta}{\cot^2\theta\,(1 - \sin^2\theta)} = 12\sec^2\theta$

2) $18\cos\theta\left(\frac{1}{\cos\theta} - \frac{\cot\theta}{\csc\theta}\right) = 18\sin^2\theta$

a. Both the equations are identities.
b. Only the second equation is an identity.
c. Only the first equation is an identity.
d. None of the equations are identities.

10. Simplify $(\cot x - \csc x)(\cot x + \csc x)$

a. -1 b. 1
c. 0 d. $\csc^2 x \cot^2 x$

11. Solve $\sin 2\theta = \sqrt{2}\sin\theta$on the interval [0, 2π).

a. $0, \pi, \frac{\pi}{4}$ b. $0, \pi, \frac{\pi}{4}, \frac{7\pi}{4}$
c. $0, \pi, \frac{3\pi}{4}, \frac{5\pi}{4}$ d. $\frac{3\pi}{2}, \frac{\pi}{2}, \frac{\pi}{4}, \frac{3\pi}{4}$

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12. Rewrite $\cos 3x \sin 5x$ as a sum or difference.

a. $\frac{1}{2}\left[\sin(8x) - \cos(-2x)\right]$ b. $\frac{1}{2}\left[\sin(8x) + \sin(-2x)\right]$

c. $\frac{1}{2}\left[\sin(8x) - \sin(-2x)\right]$ d. $\frac{1}{2}\left[\sin(-2x) - \sin(8x)\right]$

Find all solutions of each equation on the interval [0, 360).

13. $\csc x + 1 = \cot x$

a. $0, \pi$ b. π

c. $\frac{3\pi}{2}$ d. $\frac{\pi}{2}, \frac{3\pi}{2}$

14. Which of the following are the solutions of $\tan^2 x + 2 = 2\sec x$ on the interval [0, 2π)?

a. $\frac{\pi}{2}, \frac{3\pi}{2}$ b. $0, \pi$

c. π d. 0

15. Write $\cos(\arcsin x + \arccos 2x)$ as an algebraic expression of *x* that does not involve trigonometric functions.

a. $2x\sqrt{1-x^2} - x\sqrt{1-4x^2}$ b. $x\sqrt{1-x^2}$

c. $x\sqrt{1-4x^2} - 2x\sqrt{1-x^2}$ d. $x\sqrt{1-x^2} - x\sqrt{1-2x^2}$

16. Which of the following are the solutions of $\cot^2 x + 2\csc x = -2$ on the interval [0, 2π)?

a. $\frac{3\pi}{2}, \frac{\pi}{2}$ b. π

c. $\frac{\pi}{2}$ d. $\frac{3\pi}{2}$

17. Solve $6 + 4\sin x = 6 - 8\sin x$ for $0° \le x \le 180°$.

a. 90° b. 180° or 0°

c. 135° d. 30°

18. Simplify $\frac{\sin x}{\sec x - 1}$

a. $\cot x + \cot x \sin x$ b. $\cot x + \cot x \cos x$

c. $\sin x \cos x + \sin x$ d. $\cot x - \cot x \cos x$

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19. Use a half-angle identity to find the exact value of $\tan 22.5°$.

a. $\sqrt{3-2\sqrt{2}}$ b. $\sqrt{3+2\sqrt{3}}$
c. $\sqrt{3+2\sqrt{2}}$ d. $\sqrt{3-2\sqrt{3}}$

20. If $\sin\theta = -0.5$, find $\sec\left(\theta - \frac{\pi}{2}\right)$.

a. –0.5 b. 2
c. –2 d. 0.5

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