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**Precalculus_G11_Ch5_H.W.**

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

1. Simplify $\frac{1}{\cos x + 1} + \frac{1}{\cos x - 1}$.

   a. $-2 \cot x \csc x$ b. $2 \sec^2 x$
   c. $2 \csc^2 x$ d. $-2 \tan x \sec x$

2. Find the exact value of $\frac{\tan 145 - \tan 25}{1 + \tan 145 \tan 25}$.

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

3. If csc $\theta$ = –8.8, find $\cos\left(\theta - \frac{\pi}{2}\right)$.

   a. –0.11 b. 0.11
   c. –8.8 d. 8.8

4. Solve $4 + 2\cos x = 4 + 2\cos x$ for $0° \le x \le 180°$.

   a. 90° b. 180°
   c. 0° d. 30°

5. Find the exact value of $\cos \frac{13\pi}{12} + \cos \frac{5\pi}{12}$.

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

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6. Find the exact value of $\frac{\tan 129 + \tan(-69)}{1 - \tan 129 \tan(-69)}$.

a. $\frac{\sqrt{3}}{3}$ b. $\sqrt{3}$

c. $-\sqrt{3}$ d. $-\frac{\sqrt{3}}{3}$

7. What basic trigonometric identity would you use to verify that tan *x* cos *x* = sin *x*?

a. $\cos x = \frac{1}{\sec x}$ b. $\sin x = \frac{1}{\csc x}$

c. $\cos^2 x + \sin^2 x = 1$ d. $\tan x = \frac{\sin x}{\cos x}$

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

a. –0.5 b. 2

c. –2 d. 0.5

9. Solve $4 - 6\cos x = 8 - 2\cos x$ for $0° \le x \le 180°$.

a. 0° b. 30°

c. 180° d. 90°

10. What basic trigonometric identity would you use to verify that $\frac{\sin^2 x + \cos^2 x}{\cos x} = \sec x$?

a. $\sin x = \frac{1}{\csc x}$ b. $1 + \cot^2 x = \csc^2 x$

c. $\cos^2 x + \sin^2 x = 1$ d. $\cos x = \frac{1}{\sec x}$

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**Solve each equation for all values of *x*.**

11. $2\cos^2 x - 7 = -7$

a. $\frac{\pi}{2} + \frac{n\pi}{2}$

b. $\frac{\pi}{2} + n\pi$

c. $\frac{\pi}{4} + n\pi, \frac{3\pi}{4} + n\pi$

d. $\frac{\pi}{2} + 2n\pi$

12. Simplify $\frac{1}{\sec x + 1} + \frac{1}{\sec x - 1}$.

a. $-2\tan^2 x$

b. $-2\cot^2 x$

c. $2\sin x \sec^2 x$

d. $2\cos x \sec^2 x$

13. If $\sin\theta = \frac{4}{5}$ and $\theta$ terminates on the interval $\left[0, \frac{\pi}{2}\right]$, find the exact value of $\sin 2\theta$.

a. $\frac{8}{5}$

b. $\frac{25}{24}$

c. $\frac{24}{25}$

d. $\frac{-7}{25}$

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

a. $\frac{\sqrt{2-\sqrt{2}}}{2}$

b. $\frac{\sqrt{2+\sqrt{2}}}{2}$

c. $\frac{\sqrt{2+\sqrt{3}}}{2}$

d. $\frac{\sqrt{2-\sqrt{3}}}{2}$

15. If $\cos\theta = \frac{4}{9}$ and $\csc\theta < 0$, find $\sin\theta$ and $\tan\theta$.

a. $\csc\theta = 4\sqrt{9}, \tan\theta = \frac{65}{9}$

b. $\sin\theta = 4, \tan\theta = \frac{4\sqrt{65}}{9}$

c. $\sin\theta = \frac{4}{9}, \tan\theta = \frac{9}{4}$

d. $\sin\theta = \frac{\sqrt{65}}{9}, \tan\theta = \frac{\sqrt{65}}{4}$

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**Solve each equation for all values of *x*.**

16. $8\cos^2 x - 5 = -3$

a. $\frac{\pi}{6} + n\pi, \frac{5\pi}{6} + n\pi$ b. $\frac{\pi}{3} + 2n\pi, \frac{2\pi}{3} + 2n\pi$

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

17. 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. $x\sqrt{1-x^2} - x\sqrt{1-2x^2}$

18. If $\sin\theta = -\frac{3}{8}$, find $\csc\theta$.

a. $-\frac{8}{3}$ b. $-\frac{3}{8}$

c. 3 d. –8

19. $\sin 2x + \frac{\sqrt{3}}{2} = 0$

a. $\frac{\pi}{3} + \pi n; \frac{5\pi}{3} + \pi n$ b. $\frac{\pi}{3} + 2\pi n; \frac{5\pi}{3} + 2\pi n$

c. $\frac{2\pi}{3} + \pi n; \frac{5\pi}{6} + \pi n$ d. $\frac{2\pi}{3} + 2\pi n; \frac{5\pi}{6} + 2\pi n$

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

a. $x\sqrt{1-2x^2} - x\sqrt{1-x^2}$ b. $-3x\sqrt{1-x^2}$

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

21. Simplify $\cot x - \csc x \cos x$.

a. cot x csc x – cot x cos x b. 0

c. 2 cot x d. 1

22. If $\tan\theta = 2.8$, find $\cot\left(\theta - \frac{\pi}{2}\right)$.

a. –2.8 b. 0.36

c. 2.8 d. –0.36

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

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

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

24. What basic trigonometric identity would you use to verify that cot *x* sin *x* = cos *x*?

a. $\cos^2 x + \sin^2 x = 1$ b. $\cot x = \frac{\cos x}{\sin x}$

c. $\cos x = \frac{1}{\sec x}$ d. $\sin x = \frac{1}{\csc x}$

25. Simplify $(\tan\theta - \sec\theta)^2$.

a. $\frac{\sin\theta - 1}{1 + \sin\theta}$ b. $\frac{1 - \sin\theta}{1 + \sin\theta}$

c. $\tan^2\theta - \sec^2\theta$ d. $\sec^2\theta - \tan^2\theta$

26. Use a half-angle identity to find the exact value of $\cos 67.5°$.

a. $\frac{\sqrt{2+\sqrt{2}}}{2}$ b. $\frac{\sqrt{2+\sqrt{3}}}{2}$

c. $\frac{\sqrt{2-\sqrt{2}}}{2}$ d. $\frac{\sqrt{2-\sqrt{3}}}{2}$

27. Which of the following are the solutions of $\cos\left(\frac{\pi}{6} + x\right) + \sin\left(\frac{\pi}{3} + x\right) = 0$ on the interval [0, 2π)?

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

c. 0 d. $\frac{\pi}{2}, \frac{3\pi}{2}$

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

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

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

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29. Simplify $\frac{\cos^2 x - 1}{1 - \cos^2 x}$.

a. $\cot^2 x - \csc^2 x$ b. $\csc^2 x - \cot^2 x$

c. $\cot^2 x + \csc^2 x$ d. cannot be simplified

30. Solve $\sin 2\theta = \cos\theta$ on the interval $[0, 2\pi)$.

a. $\frac{3\pi}{2}, \frac{\pi}{2}, \frac{\pi}{6}, \frac{5\pi}{6}$ b. $\frac{\pi}{2}, \frac{\pi}{6}$

c. $0, \pi, \frac{\pi}{3}, \frac{5\pi}{3}$ d. $\frac{3\pi}{2}, \frac{\pi}{2}, \frac{7\pi}{6}, \frac{11\pi}{6}$

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