SM 3H

Unit 8 Test Review

2023-2024

SCORE: /

Name _____ Date _____ Period _____

Use identities to simplify each expression.

1. $\dfrac{\tan x \csc x}{\sec x}$

2. $\tan^2 x - \dfrac{\sin(-x)}{\sin x}$

3. $\csc x \tan x + \sec(-x)$

4. $(1-\csc x)(1-\csc(-x))$

Multiply and simplify:

5. $\sin\theta\cos\theta(\tan\theta+\cot\theta)$

Factor and simplify:

6. $\cos^2 x \tan^2 x + \cos^2 x$

Verify each identity:

7. $\dfrac{\sin x \cos x}{\tan x} = 1 - \sin^2 x$

8. $\cot(-x) = \dfrac{1 - \sin^2 x}{\cos(-x)\sin(-x)}$

9. $\dfrac{\sin 2\beta}{2\csc\beta} = \sin^2\beta\cos\beta$

10. $\dfrac{1}{\sec\theta - 1} - \dfrac{1}{\sec\theta + 1} = 2\cot^2\theta$

11. $\cos(3x) = \cos x\left(1 - 4\sin^2 x\right)$

12. $\sin^2(\theta)\sec^2(\theta) + \sin^2(\theta)\csc^2(\theta) = \sec^2(\theta)$

13. Use trigonometric identities to find the values of the other five trigonometric functions if $\cos\alpha = 1/\sqrt{5}$ and α is in quadrant IV.

Find the exact value by using a sum or difference identity:

14. $\cos\left(\frac{7\pi}{12}\right)$

15. $\sin\left(\frac{\pi}{12}\right)$

16. $\tan(165°)$

17. $\cos(75°)$

Use the sum/difference identities to simplify each expression.

18. $\cos 75°\cos 60° - \sin 75°\sin 60°$

19. $\sin 80°\cos 50° - \cos 80°\sin 50°$

Use the sum/difference identities to simplify each expression.

20. Find $\sin(A+B)$ if $\sin A = -5/13$ and $\cos B = 2/5$, with A in quadrant III and B in quadrant I.

21. Find $\cos(\alpha-\beta)$ if $\sin\alpha = 15/17$ and $\sin(\beta) = -1/3$, with α in quadrant II and β in quadrant IV.

Find all real numbers that satisfy the equation. Write answers in terms of π (radians).

22. $-2\cos(2x) = \sqrt{3}$

Find all values of α in $[0°, 360°)$ that satisfy each equation.

23. $2 \cdot 2\sin x \cos x = \sqrt{3}$

24. $\sin(2x)\cos x = \sin x$

Find all values for the variable in [0°, 360°) that satisfy each equation.

25. $\cos(2x) - 1 = \sin^2 x$

26. Solve $\sin^2\theta - \sin\theta = 2$ on the interval $0 \le \theta < 2\pi$

27. Solve $2\cos^2 x - \sqrt{3}\cos x = 0$ on the interval $0° \le x < 360°$

Find all values of α in [0°, 360°) that satisfy each equation.

28. $\sin\left(\frac{x}{3}\right) = \frac{\sqrt{3}}{2}$

29. $3 + \tan\left(\frac{x}{2}\right) = 3$

Find the exact value using a **double-angle identity**. Show work to receive full credit!

30. $\sin 480°$