7.1-7.3 Quiz Review

Name:_____

Pre-Calculus

Simplify the trigonometric expression.

1. $\tan x \csc x$

2. $\cos^2 x\,(1 + \tan^2 x)$

3. $\cos^3 x + \sin^2 x \cos x$

4. $\frac{1+\cot x}{\csc x}$

Verify the identity.

5. $\frac{\cot x \sec x}{\csc x} = 1$

6. $\frac{\cos x}{\sec x \sin x} = \csc x - \sin x$

7. $\csc x\,(\csc x + \sin(-x)) = \cot^2 x$

8. $(\sin x + \cos x)^2 = 1 + 2 \sin x \cos x$

9. $\csc x - \sin x = \cos x \cot x$

10. $\cot^2 x \cos^2 x = \cot^2 x - \cos^2 x$

11. $\frac{\sin x}{1-\cos x} - \cot x = \csc x$

12. $\sin x \left(\frac{1}{\sin x} - \frac{\cos x}{\cot x}\right) = \cos^2 x$

13. $\sin x \cos x \tan x + \cos^2 x = 1$

14. $\sin\left(\frac{\pi}{2} - x\right) - \sin\left(\frac{\pi}{2} + x\right) = 0$

15. $\frac{\sin(x+\pi)}{\cos(x-\pi)} = \tan x$

16. $\cos(x-\pi) = -\cos x$

17. $1 - \tan x \tan y = \frac{\cos(x+y)}{\cos x \cos y}$

18. $\cos x - \sin x = \frac{\cos 2x}{\cos x + \sin x}$

19. $\sin 8x = 2 \sin 4x \cos 4x$

20. $\cos x - 1 = \frac{\cos 2x - 1}{2(\cos x + 1)}$

21. $\sin\frac{x}{2}\cos\frac{x}{2} = \frac{\sin x}{2}$

Use an addition or subtraction formula to find the exact value of the expression.

22. sin 15°

23. cos 195°

24. tan $\frac{23\pi}{12}$

Use a half-angle identity to find the exact value of the expression.

25. sin 75°

26. cos $\frac{7\pi}{12}$

27. tan 22.5°

Find sin 2x, cos 2x, and tan 2x using the given information.

28. tan x = $-\frac{4}{3}$; x in Q2

29. sec x = 2; sin x < 0

Find $sin\frac{x}{2}$, $cos\frac{x}{2}$, and $tan\frac{x}{2}$ using the given information.

30. cos x = $-\frac{4}{5}$; 180° < x < 270°

31. cot x = -5; 270° < x < 360°

Answers:

1. $\sec x$ **2**. 1 **3**. $\cos x$ **4**. $\sin x + \cos x$ **5-21.** Verify the identities

22. $\frac{\sqrt{6}-\sqrt{2}}{4}$ **23**. $\frac{-\sqrt{6}-\sqrt{2}}{4}$ **24**. $-2 + \sqrt{3}$ **25**. $\frac{\sqrt{2+\sqrt{3}}}{2}$ **26**. $\frac{-\sqrt{2-\sqrt{3}}}{2}$ **27**. $\sqrt{2} - 1$

28. $\sin 2x = -\frac{24}{25}$ $\cos 2x = -\frac{7}{25}$ $\tan 2x = \frac{24}{7}$ **29**. $\sin 2x = -\frac{\sqrt{3}}{2}$ $\cos 2x = -\frac{1}{2}$ $\tan 2x = \sqrt{3}$

30. $\sin\frac{x}{2} = \frac{3\sqrt{10}}{10}$ $\cos\frac{x}{2} = -\frac{\sqrt{10}}{10}$ $\tan\frac{x}{2} = -3$

31. $\sin\frac{x}{2} = \sqrt{\frac{26+5\sqrt{26}}{52}}$ $\cos\frac{x}{2} = -\sqrt{\frac{26-5\sqrt{26}}{52}}$ $\tan\frac{x}{2} = \frac{26+5\sqrt{26}}{\sqrt{26}}$ or $\frac{13\sqrt{26}+75}{13}$