Quiz Review

Name: Key

Evaluate each expression using your unit circle.

1. $\sec 180°$

-1

2. $\sin 45°$

$\sqrt{2}/2$

3. $\cos \frac{5\pi}{3}$

$1/2$

4. $\tan \frac{3\pi}{4}$

-1

5. $\csc 5\pi$

und

6. $\tan \frac{2\pi}{3}$

$-\sqrt{3}$

Simplify each expression

7. $\frac{\sec x - \cos x}{\sin x}$ $\cdot \frac{\cos x}{\cos x}$

$\frac{\frac{1}{\cos x} - \frac{\cos^2 x}{\cos x}}{\sin x}$

$\frac{\sin^2 x}{\cos x} \cdot \frac{1}{\sin x} = \boxed{\tan x}$

8. $(\cos^2 x)(\sec x)(\tan x)$

$\cos^2 x \cdot \frac{1}{\cos x} \cdot \frac{\sin x}{\cos x}$

$\boxed{\sin x}$

9. $\cos\theta \tan^2\theta + \cos\theta$

$\cos\theta(\tan^2\theta + 1)$

$\cos\theta(\sec^2\theta)$

$\cos\theta \frac{1}{\cos^2\theta} = \frac{1}{\cos\theta} = \boxed{\sec\theta}$

10. $\frac{1-\sin^2 x}{1-\cos^2 x}$ $= \frac{\cos^2 x}{\sin^2 x} = \boxed{\cot^2 x}$

Verify each identity.

11. $\cos(90 - \theta) = \sin\theta$

$\cos 90\cos\theta + \sin 90\sin\theta = \sin\theta$

$0 \cdot \cos\theta + 1 \cdot \sin\theta = \sin\theta$

$\sin\theta = \sin\theta$ ✓

12. $\csc^2\theta = \cot^2\theta + \sin\theta\csc\theta$

$\csc^2\theta = \cot^2\theta + 1$

$\csc^2\theta = \csc^2\theta$ ✓

13. $\tan\theta(\cot\theta + \tan\theta) = \sec^2\theta$

$1 + \tan^2\theta = \sec^2\theta$

$\sec^2\theta = \sec^2\theta$ ✓

14. $\sec x \csc x = \tan x + \cot x$

$\frac{1}{\cos x \sin x} = \frac{\sin x}{\cos x} \cdot \frac{\sin x}{\sin x} + \frac{\cos x}{\sin x} \cdot \frac{\cos x}{\cos x}$

$= \frac{\sin^2 x}{\cos x \sin x} + \frac{\cos^2 x}{\sin x \cos x}$

$\frac{1}{\cos x \sin x} = \frac{1}{\cos x \sin x}$ ✓

15. Solve $\cos x \tan x - \sin^2 x = 0$ for all real values of x.

$\cos x \cdot \frac{\sin x}{\cos x} - \sin^2 x = 0$

$\sin x - \sin^2 x = 0$

$\sin x(1 - \sin x) = 0$

$\sin x = 0 \quad 1 - \sin x = 0$

$\sin x = 1$

$x = \pi k, \frac{\pi}{2} + 2\pi k$

16. Solve $2\cos^2 x = \sqrt{3}\cos x$ for principal values of x. Express the solution(s) in degrees.

$2\cos^2 x - \sqrt{3}\cos x = 0$

$\cos x(2\cos x - \sqrt{3}) = 0$

$\cos x = 0 \quad \cos x = \sqrt{3}/2$

$x = 90°, 30°$

17. Solve $\csc x + 2 = 0$ for $0° \le x < 360°$.

$\csc x = -2$

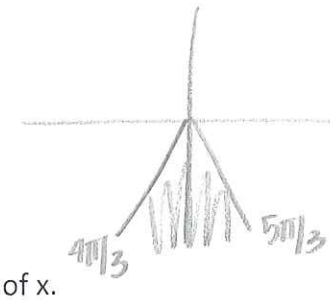
$\sin x = -\frac{1}{2}$

$x = 210°, 330°$

18. Solve $2\sin x + \sqrt{3} < 0$ for $0 \le x < 2\pi$.

$\sin x < -\sqrt{3}/2$

$\frac{4\pi}{3} < x < \frac{5\pi}{3}$



19. Solve $2\cos x - \sin^2 x + 2 = 0$ for all real values of x.

$2\cos x - (1 - \cos^2 x) + 2 = 0$

$\cos^2 x + 2\cos x + 1 = 0$

$(\cos x + 1)(\cos x + 1) = 0$

$\cos x = -1$

$\pi + 2\pi k$

Evaluate each limit

20. $\lim_{x \to -2} (x^3 - x^2 - 5x + 6)$ $(-2)^3 - (-2)^2 - 5(-2) + 6 = 4$

21. $\lim_{x \to 0} \frac{x^2 + x\cos x}{2x}$ $\lim_{x \to 0} \frac{x(x + \cos x)}{2x} = \frac{0 + \cos 0}{2} = \frac{1}{2}$

22. $\lim_{x \to 0} (2x - \cos x)$ $2(0) - \cos 0 = -1$

23. $\lim_{x \to 2} \frac{x^3 + 2x^2 - 4x - 8}{x^2 - 4}$ $\lim_{x \to 2} \frac{x^2(x+2) - 4(x+2)}{(x-2)(x+2)} = \lim_{x \to 2} \frac{x^2 - 4}{x - 2}$

24. $\lim_{x \to 1} \frac{x^2 - 36}{x + 6}$ $\frac{1 - 36}{7} = -5$

25. $\lim_{x \to 0} \frac{(x-3)^2 - 9}{2x}$ $\lim_{x \to 0} \frac{x^2 - 6x + 9 - 9}{2x} = \lim_{x \to 0} \frac{x(x-6)}{2x}$ $\lim_{x \to 2} \frac{(x-2)(x+2)}{x-2} = 4$

26. $\lim_{x \to 0} \frac{5x^2}{2x}$ $\frac{5(0)}{2} = 0$

27. $\lim_{x \to 5} \frac{x^2 - 9x + 20}{x^2 - 5x}$ $\lim_{x \to 5} \frac{(x-5)(x-4)}{x(x-5)} = \lim_{x \to 5} \frac{x-4}{x} = \frac{5-4}{5} = \frac{1}{5}$

$\frac{0-6}{2} = -3$

28. $\lim_{x \to -1} \frac{x^2 + 2x}{x^2 - 3x - 10}$ $\frac{4^2 + 2(4)}{4^2 - 3(4) - 10} = \frac{24}{-6} = -4$

29. $\lim_{x \to 0} (x + \sin x)$ $0 + \sin 0 = 0$