

Verify. Show enough work so that I can duplicate your answers.

1. $\frac{\tan \alpha}{\sec \alpha} = \sin \alpha$

2. $\frac{1 - \sin^2 \beta}{\cos \beta} = \cos \beta$

3. $\cos^2 \beta (\tan^2 \beta + 1) = 1$

4. $(1 - \cos^2 x)(1 + \cos^2 x) = 2\sin^2 x - \sin^4 x$

5. $\sin(210^\circ + x) - \cos(120^\circ + x) = 0$

6. $\cos(x + y) + \cos(x - y) = 2 \cos x \cos y$

$$7. 1 + \cos 2x = \cot x \sin 2x$$

$$8. \sec^4 x - \sec^2 x = \tan^4 x + \tan^2 x$$

$$9. \frac{\sin^2 \theta}{1 + \cos \theta} = 1 - \cos \theta$$

$$10. \sec 2x = \frac{1}{1 - 2 \sin^2 x}$$

$$11. \sin^3 x \cos^2 x = \cos^2 x \sin x - \cos^4 x \sin x$$

$$\star 12 \star \sec \theta + \tan \theta = \frac{1}{\sec \theta - \tan \theta}$$

$$13. \frac{\sec x}{\sin x} - \frac{\sin x}{\cos x} = \cot x$$

$$14. \frac{1}{\sin x \cos x} - \frac{\cos x}{\sin x} = \tan x$$

$$15. \sec \theta - \cos \theta = \sin \theta \tan \theta$$

$$16. \frac{\csc^2 x - 1}{\cos x} = \cot x \csc x$$

$$17. \sin(\theta + 60^\circ) - \cos(\theta + 30^\circ) = \sin \theta$$

$$18. \tan \theta = \frac{1 - \cos 2\theta}{\sin 2\theta}$$

$$19. \cos^2 x + \tan^2 x \cdot \cos^2 x = 1$$

$$20. \frac{1 - \cos \theta}{1 + \cos \theta} = (\csc \theta - \cot \theta)^2$$

$$21. \frac{\sec \theta + 1}{\tan \theta} = \frac{\tan \theta}{\sec \theta - 1}$$

$$22. \frac{\sin^4 \beta - \cos^4 \beta}{\sin^2 \beta} = 1 - \cot^2 \beta$$

$$23. \cos(90^\circ - \theta) = \sin \theta$$

$$24. \cos\left(\frac{\pi}{3} + x\right) + \cos\left(\frac{\pi}{3} - x\right) = \cos x$$

$$25. \tan(\pi - x) = -\tan x$$

$$26. \cos(\alpha + \beta) + \cos(\alpha - \beta) = 2 \cos \alpha \cos \beta$$

Use Pythagorean Identities to find the indicated trigonometric function.

$$27. \text{ Given } \sin x = -\frac{2}{3}, \pi < x < \frac{3\pi}{2}, \text{ find } \cos x.$$

$$28. \text{ Given } \cos x = \frac{3}{4}, \frac{3\pi}{2} < x < 2\pi, \text{ find } \tan x.$$

$$29. \text{ Given } \cot \theta = -\frac{4}{7}, 270^\circ < \theta < 360^\circ, \text{ find } \sin \theta.$$

Multiple Choice.

30. Solve. $1 + 2 \sin x = 0$, where $0 \leq x \leq 2\pi$.

a. $\frac{4\pi}{3}, \frac{5\pi}{3}$

b. $\frac{5\pi}{6}, \frac{7\pi}{6}$

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

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

e. $\frac{7\pi}{6}, \frac{11\pi}{6}$

31. Simplify. $\frac{\sin 2\theta}{\sin \theta}$.

a. 2

b. $\sin \theta$

c. $\cos \theta$

d. $2 \cos \theta$

e. $2 \sin \theta$

32. Simplify. $\sin\left(x + \frac{\pi}{3}\right) + \sin\left(x - \frac{\pi}{3}\right)$.

a. $\frac{\sqrt{3}}{4} \sin x$

b. $\sin x$

c. $\sqrt{3} \sin x$

d. $2 \sin x$

e. $\frac{1}{2} \sin x$

33. Simplify. $\frac{\csc^2 x - 1}{\csc^2 x}$.

- a. 1
- b. $\cos^2 x$
- c. $\sin^2 x$
- d. $-\cos^2 x$
- e. $-\sin^2 x$

34. Simplify. $\cos(\pi - 2x)$.

- a. $-\cos 2x$
- b. $-\sin 2x$
- c. $\cos 2x$
- d. $\sin 2x$
- e. 1

35. Solve. $2\cos^2 x - \cos x - 1 = 0$, where $0 \leq x \leq 2\pi$.

- a. $0, \frac{5\pi}{6}, \frac{7\pi}{6}$
- b. $0, \frac{2\pi}{3}, \frac{4\pi}{3}$
- c. $\frac{\pi}{6}, \pi, \frac{11\pi}{6}$
- d. $\frac{\pi}{3}, \pi, \frac{5\pi}{3}$
- e. $\frac{\pi}{2}, \frac{2\pi}{3}, \frac{4\pi}{3}$

36. Simplify. $\tan^2 \theta \csc \theta + \frac{1}{\sin \theta}$.

- a. $\sec^3 \theta$
- b. $\csc^3 \theta$
- c. $\csc^2 \theta \sec \theta$
- d. $\sec^2 \theta \csc \theta$
- e. $\tan \theta + \csc \theta$

37. Solve. $2\cos^2 x - 1 = 0$, where $0 \leq x \leq 2\pi$.

a. $\frac{\pi}{4}, \frac{3\pi}{4}$

b. $\frac{\pi}{4}, \frac{7\pi}{4}$

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

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

e. $\frac{\pi}{3}, \frac{2\pi}{3}, \frac{4\pi}{3}, \frac{5\pi}{3}$

38. Simplify. $\frac{\cos x + \cot x}{\sin x + 1}$.

a. $\sin x$

b. $\sec x$

c. $\csc x$

d. $\cot x$

e. $\tan x$