

1. Find all values of x for which $\sin x = 1$.

- a) $-\frac{\pi}{2} + 2k\pi$
- b) $k\pi$
- c) $\frac{\pi}{3} + 2k\pi$
- d) $\frac{\pi}{2} + 2k\pi$
- e) $\frac{\pi}{4} + 2k\pi$

2. Find the period of the function $y = 3 \cos 4x$.

- a) $\frac{\pi}{2}$
- b) π
- c) 4
- d) $\frac{\pi}{4}$
- e) 2π

3. Graph one complete cycle of $y = 16 \sin x$.

4. Identify the graph of the function $y = 2 \sin(-3x)$ for $0 \leq x \leq 2\pi$.

5. Identify the amplitude and phase shift for the equation $y = \cos\left(\frac{1}{3}x + \frac{\pi}{2}\right)$.

- a) Amplitude = 1 and Phase shift = $\frac{3\pi}{2}$
- b) Amplitude = 1 and Phase shift = $-\frac{\pi}{2}$
- c) Amplitude = 1 and Phase shift = $-\frac{3\pi}{2}$
- d) Amplitude = 1 and Phase shift = $-\frac{\pi}{2}$
- e) Amplitude = 2 and Phase shift = $-\pi$

6. Identify the graph of the equation $y = \sin\left(2x - \frac{\pi}{2}\right)$ over the interval $-\frac{\pi}{4} \leq x \leq \frac{3\pi}{2}$.

7. The graph below is one complete cycle of the graph of an equation containing a trigonometric function. Find an equation to match the graph.

- a) $y = 5 - 4 \cos \pi x$
- b) $y = 2 - \cos \pi x$
- c) $y = 4 + 3 \cos \pi x$
- d) $y = 5 - \cos \pi x$
- e) $y = 2 - 4 \cos \pi x$

8. The graph below is one complete cycle of the graph of an equation containing a trigonometric function. Find an equation to match the graph.

- a) $y = 2 \sin\left(3x - \frac{\pi}{2}\right) - 4$
- b) $y = 4 \sin\left(3x - \frac{\pi}{2}\right) - 4$
- c) $y = 6 \sin\left(3x - \frac{\pi}{2}\right) - 3$
- d) $y = 7 \sin\left(3x - \frac{\pi}{2}\right) - 4$
- e) $y = 5 \sin\left(3x - \frac{\pi}{2}\right) - 4$

9. Simplify $2|\sin \theta|$ if $\theta = \cos^{-1} \frac{x}{2}$ for some real number x .

- a) $-\sqrt{4-x^2}$
- b) $\sqrt{4-x^2}$
- c) $\sqrt{2-x^2}$
- d) $-\sqrt{x^2-4}$
- e) $\sqrt{x^2-4}$

10. Evaluate $\sec\left(\cos^{-1} \frac{1}{\sqrt{7}}\right)$.

- a) -7
- b) 7
- c) $-\sqrt{7}$
- d) $-\frac{1}{7}$
- e) $\sqrt{7}$

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

- a) 1
- b) $\cos^2 x$
- c) $\cot^2 x$
- d) 0
- e) $\tan x$

12. Simplify $\frac{\sin^4 t - \cos^4 t}{\sin^2 t}$.

- a) $1 - \tan^2 t$
- b) $\cot t$
- c) $1 - \cot^2 t$
- d) $\cot^2 t - 1$
- e) $\tan^2 t - 1$

13. Simplify $\sin\left(x - \frac{3\pi}{2}\right)$.

- a) $\cos x$
- b) $-\sin x$
- c) $-\cos x$
- d) $\tan x$
- e) $\sin x$

14. Find the identical expression for $\frac{\sin(A+B)}{\cos A \cos B}$.

- a) $\tan A - \tan B$
- b) $\cot A + \tan B$
- c) $\tan A + \tan B$
- d) $\cot A + \cot B$
- e) $\tan A + \cot B$

15. If $\cos A = \frac{2}{\sqrt{13}}$ with A in quadrant IV, find $\cot 2A$.

- a) $-\frac{12}{5}$
- b) $\frac{5}{36}$
- c) $-\frac{5}{6}$
- d) $\frac{5}{18}$
- e) $\frac{5}{12}$

16. Evaluate $\cos^2 \frac{\pi}{6} - \sin^2 \frac{\pi}{6}$

- a) $-\frac{\sqrt{3}}{4}$
- b) $-\frac{\sqrt{2}}{4}$
- c) $-\frac{\sqrt{3}}{2}$
- d) $\frac{1}{3}$
- e) $\frac{1}{2}$

17. If $\sin A = -\frac{4}{5}$ with A in quadrant IV and $\sin B = \frac{3}{5}$ with B in quadrant I, find $\sin(A+B)$.

- a) $\sin(A+B) = \frac{7}{23}$
- b) $\sin(A+B) = -\frac{9}{23}$
- c) $\sin(A+B) = -\frac{9}{25}$
- d) $\sin(A+B) = \frac{7}{25}$
- e) $\sin(A+B) = -\frac{7}{25}$

18. Use half-angle formulas to find the exact value for $\cot 75^\circ$.

- a) $\cot 75^\circ = 2 - \sqrt{3}$
- b) $\cot 75^\circ = \frac{1}{3}$
- c) $\cot 75^\circ = -\frac{1}{3}$
- d) $\cot 75^\circ = \frac{\sqrt{1+\sqrt{3}}}{2}$
- e) $\cot 75^\circ = \frac{\sqrt{2-\sqrt{3}}}{2}$

19. Evaluate $\sin\left(2\cos^{-1}\frac{1}{\sqrt{17}}\right)$.

- a) $-\frac{8}{17}$
- b) $\frac{8}{17}$
- c) $\frac{2}{\sqrt{17}}$
- d) $-\frac{10}{17}$
- e) $\frac{10}{17}$

20. Rewrite the expression $\sin \frac{7\pi}{12} + \sin \frac{\pi}{12}$ as a product and simplify.

- a) $\sqrt{6}$
- b) $\frac{1}{2\sqrt{6}}$
- c) $\frac{\sqrt{6}}{2}$
- d) $2\sqrt{6}$
- e) $-\frac{\sqrt{6}}{2}$