

1. Solve the equation $\log_3(5x+3) = 2 + \log_3 2$

A. $x = 3$

B. $x = \frac{3}{5}$

C. $x = 2$

D. $x = \frac{2}{5}$

E. No Solution

2. If p denotes the selling price (in dollars) of a commodity and x is the corresponding demand (in number sold per day), then the relationship between p and x is sometimes given by $p = p_0 e^{(-ax)}$, where p_0 and a are positive constants. Express x as a function of p .

A. $x(p) = -a \ln \frac{p}{p_0}$

B. $x(p) = -ap_0 \ln p$

C. $x(p) = \frac{\ln \frac{p}{p_0}}{-a}$

D. $x(p) = \frac{\ln p}{-ap_0}$

3. How long it will take for a sum of money to double if it is invested at a rate of 9% per year compounded continually.

A. Between 3 and 4 years.

B. Between 4 and 5 years.

C. Between 5 and 6 years.

D. Between 6 and 7 years.

E. Between 7 and 8 years

4. Find the angle that is supplementary to $38^{\circ}25'4''$.
- A. $51^{\circ}34'56''$
 - B. $141^{\circ}34'56''$
 - C. $142^{\circ}35'56''$
 - D. $52^{\circ}35'56''$
 - E. None of the above
5. Find the central angle θ subtended by the arc $s = 13.8 \text{ cm}$ with radius $r = 10.5 \text{ cm}$. Give your answer to the nearest minute.
- A. $75^{\circ}18'$
 - B. $39^{\circ}56'$
 - C. $75^{\circ}30'$
 - D. $39^{\circ}9'$
 - E. None of the above
6. A forester, 182 feet from the base of a redwood tree, observes that the angle between the ground and the top of the tree is 52° . To the nearest foot, what is the height of the tree?
- A. 112 *feet*
 - B. 184 *feet*
 - C. 215 *feet*
 - D. 233 *feet*
 - E. None of the above

7. Approximate $\csc 125^\circ$ to four decimal places.
- A. -1.4281
 - B. 1.2208
 - C. -1.7434
 - D. 0.7002
 - E. None of the above
8. Find the quadrant containing θ if $\tan \theta < 0$ and $\cos \theta > 0$
- A. Quadrant I
 - B. Quadrant II
 - C. Quadrant III
 - D. Quadrant IV
 - E. Quadrant V (this is a really bad answer, do not pick this!)
9. Find the exact value of x in the interval $[0, 4\pi)$, that satisfy the equation $\cos x = \frac{\sqrt{2}}{2}$
- A. $\frac{\pi}{4}, \frac{7\pi}{4}, \frac{9\pi}{4}, \frac{15\pi}{4}$
 - B. $\frac{3\pi}{4}, \frac{5\pi}{4}, \frac{11\pi}{4}, \frac{13\pi}{4}$
 - C. $\frac{\pi}{3}, \frac{5\pi}{3}, \frac{7\pi}{3}, \frac{11\pi}{3}$
 - D. $\frac{2\pi}{3}, \frac{4\pi}{3}, \frac{8\pi}{3}, \frac{10\pi}{3}$
 - E. None of the above

10. Find the reference angle θ_r if $\theta = 240^\circ$

- A. 45°
- B. 30°
- C. 60°
- D. 15°
- E. None of the above

11. Approximate, to the nearest 0.0001 radians, all angles θ in the interval $[0, 2\pi)$ that satisfy the equation $\cos \theta = 0.9512$.

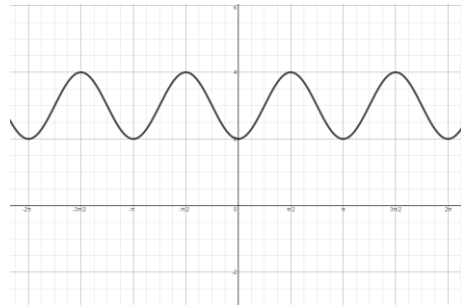
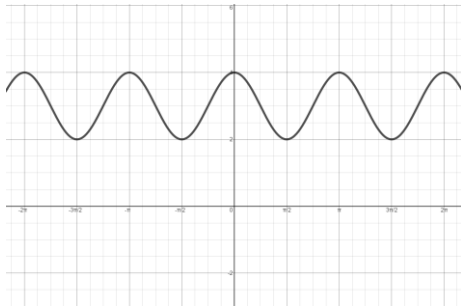
- A. 2.8279, 5.9695
- B. 0.3137, 3.4553
- C. 2.8279, 3.4553
- D. 0.3137, 5.9695
- E. None of the above

12. Find all solutions of the equation with n representing any integer.

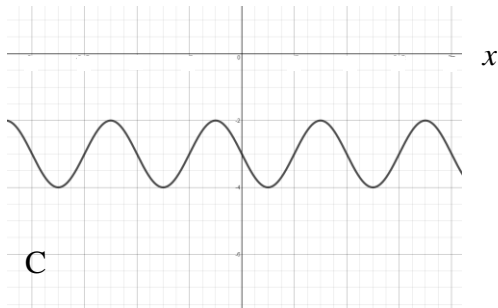
$$\sin x = \frac{\sqrt{3}}{2}$$

- A. $x = \frac{\pi}{2} + 2\pi n, \frac{3\pi}{2} + 2\pi n$
- B. $x = \frac{\pi}{3} + 2\pi n, \frac{2\pi}{3} + 2\pi n$
- C. $x = \frac{\pi}{6} + 2\pi n, \frac{5\pi}{6} + 2\pi n$
- D. $x = \frac{\pi}{4} + 2\pi n, \frac{3\pi}{4} + 2\pi n$
- E. None of the above

13. Which of the following graphs best represents the graph of $f(x) = \sin\left(2x + \frac{\pi}{2}\right) + 3$
(Yes, there are no units marked on the x -axis. Graph the function and pick the best choice.)

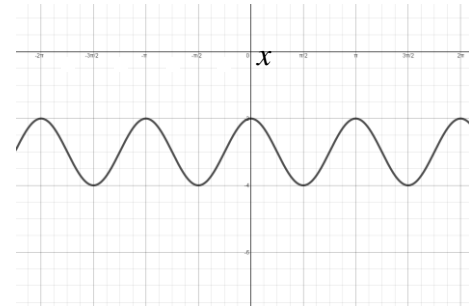


A



C

D



14. Find the Amplitude of the function $f(x) = 4\sin\left(2x - \frac{\pi}{4}\right)$

A. Amplitude = π

B. Amplitude = $\frac{\pi}{8}$

C. Amplitude = 4

D. Amplitude = $\frac{\pi}{2}$

E. Amplitude = 2

15. Find the period of the sine function

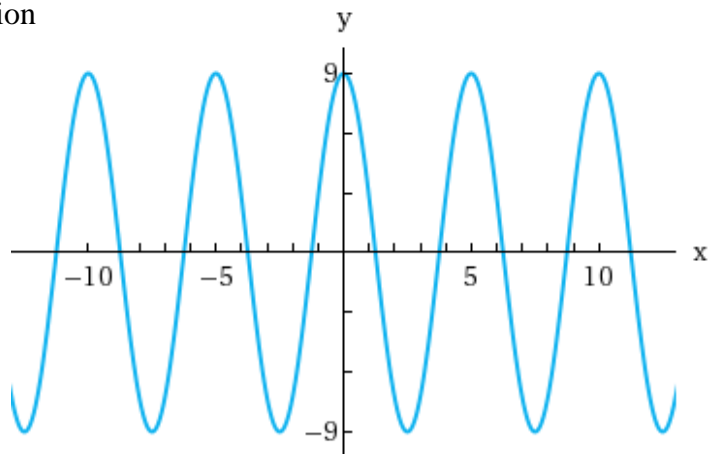
A. Period = 10

B. Period = 4

C. Period = 8

D. Period = 2.5

E. Period = 5



Answers:

1. A
2. C
3. E
4. B
5. A
6. D
7. B
8. D
9. A
10. C
11. D
12. B
13. A
14. C
15. E