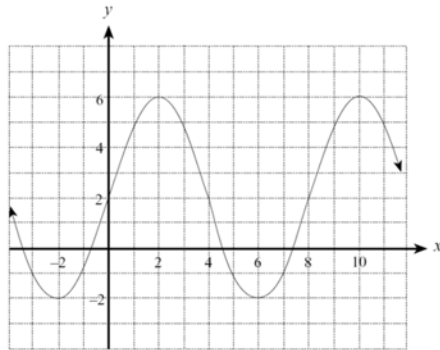
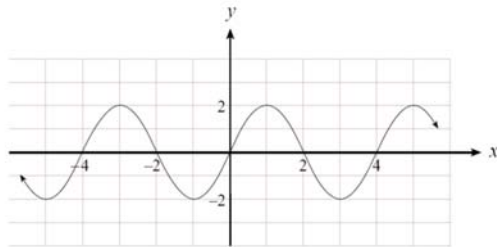


PreCalc12 Unit 5#1

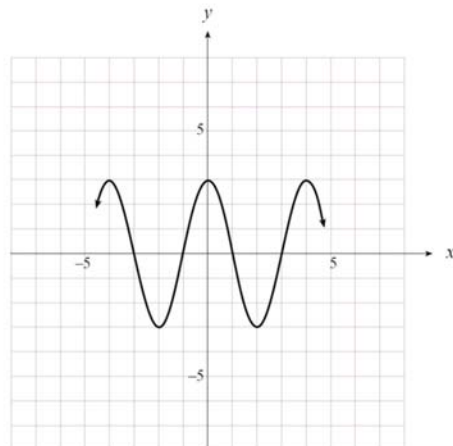
1. Determine the amplitude of the function whose graph is shown.



- A. 2
B. 4
C. 6
D. 8
2. Determine the amplitude of the function graphed below.

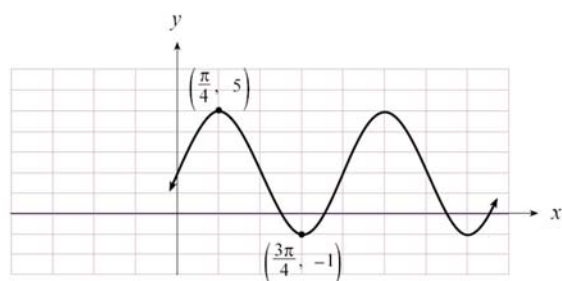


- A. -4
B. -2
C. 2
D. 4
3. Determine the minimum value of the function $y = -3 \sin x + 2$.
- A. -5
B. -3
C. -1
D. 5
4. Give the range of the function $f(x) = 3 \sin x + 7$.
- A. $-10 \leq y \leq -4$
B. $-3 \leq y \leq 3$
C. $0 \leq y \leq 6$
D. $4 \leq y \leq 10$
5. Determine the period of the trigonometric function graphed below.

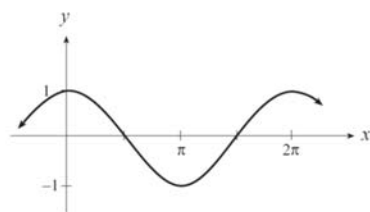


- A. 2
B. 3
C. 4
D. 6

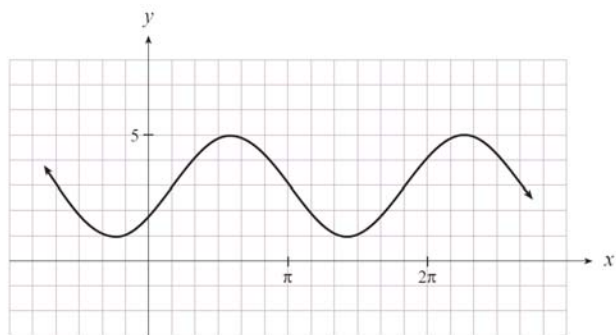
6. Determine the period of the function graphed below.



- A. $\frac{\pi}{4}$
 B. $\frac{\pi}{2}$
 C. π
 D. 2π
7. Determine an equation of the trigonometric function graphed below.



- A. $y = \cos x$
 B. $y = \sin x$
 C. $y = -\cos x$
 D. $y = -\sin x$
8. Find the period of the sine function which has a minimum point at $(\frac{\pi}{3}, 1)$ and its nearest maximum point to the right at $(\frac{2\pi}{3}, 5)$.
- A. $\frac{\pi}{3}$
 B. $\frac{2\pi}{3}$
 C. $\frac{4\pi}{3}$
 D. 2π
9. Determine the range of the function $y = 3 \sin x - 1$.
- A. $-2 \leq y \leq 0$
 B. $-2 \leq y \leq 4$
 C. $-3 \leq y \leq 3$
 D. $-4 \leq y \leq 2$
10. The range of the trigonometric function $y = a \cos x + b$ is $-2 \leq y \leq 8$. Determine the value of b .
- A. 3
 B. 5
 C. 6
 D. 10



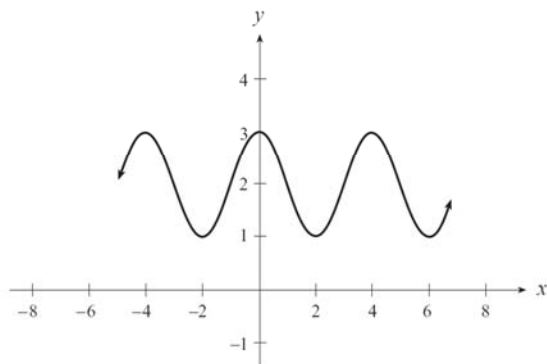
11. Determine the amplitude of the sine function shown in the graph above.

- A. 2
- B. 3
- C. 4
- D. 5

12. Determine the period of the sine function shown in the graph above.

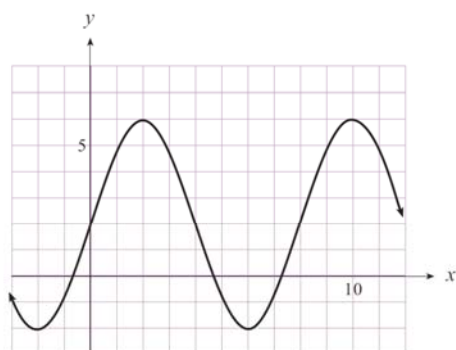
- A. $\frac{5\pi}{6}$
- B. π
- C. $\frac{5\pi}{3}$
- D. $\frac{11\pi}{6}$

13. Determine the period of the trigonometric function graphed below.



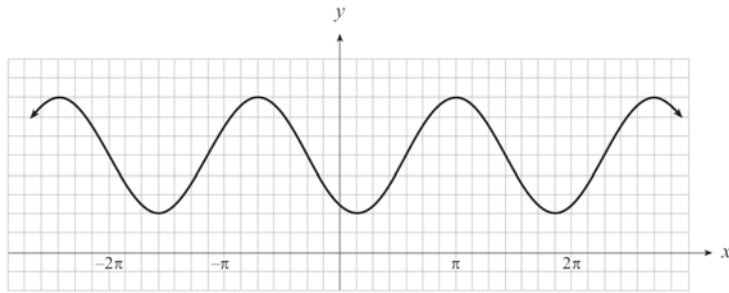
- A. 1
- B. 2
- C. 3
- D. 4

14. Determine the amplitude of the trigonometric function graphed below.



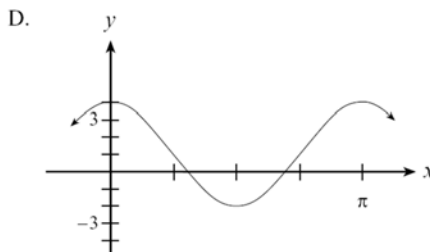
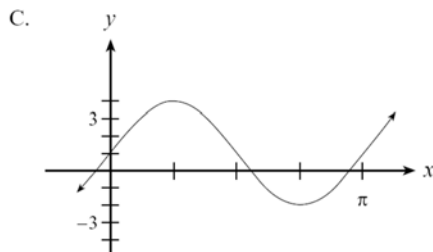
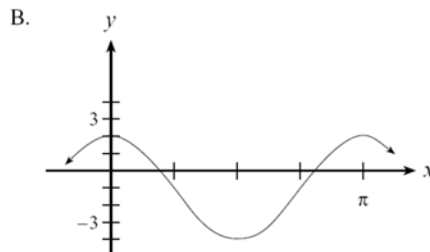
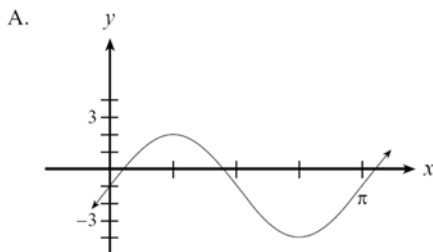
- A. 2
- B. 4
- C. 6
- D. 8

15. Determine the period of the sine function shown below.

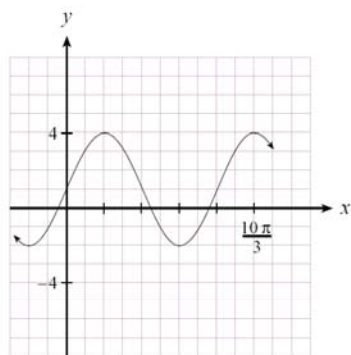


- A. π
- B. 2π
- C. $\frac{6\pi}{7}$
- D. $\frac{12\pi}{7}$
16. Determine the phase shift of the function $f(x) = \sin\left(2x - \frac{\pi}{6}\right) + \frac{\pi}{2}$.
- A. $\frac{\pi}{12}$
- B. $\frac{\pi}{6}$
- C. $\frac{\pi}{3}$
- D. $\frac{\pi}{2}$
17. Determine the amplitude of the graph of $y = -\frac{3}{5} \sin \frac{1}{3}x$.
- A. $-\frac{3}{5}$
- B. $\frac{1}{3}$
- C. $\frac{3}{5}$
- D. $\frac{2\pi}{3}$

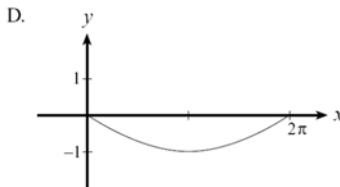
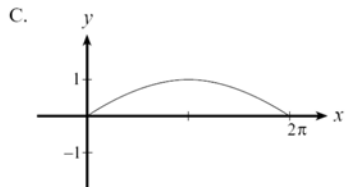
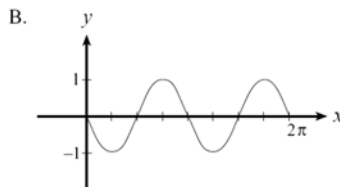
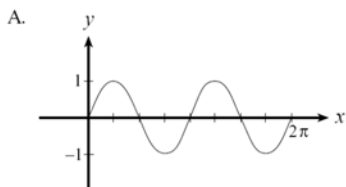
18. Which of the following represents the graph of $y = 3 \sin 2x - 1$?



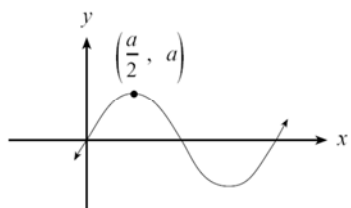
19. The function $y = a \cos b(x - c) + d$ is graphed below. Determine b .



- A. $\frac{3}{5}$
 B. $\frac{3}{4}$
 C. $\frac{8\pi}{3}$
 D. $\frac{10\pi}{3}$
20. Determine the range of the function $y = 2 \cos(3\theta - \pi) + 1$.
- A. $-3 \leq y \leq 1$
 B. $-2 \leq y \leq 2$
 C. $-1 \leq y \leq 3$
 D. all real numbers
21. Which of the following is the graph of $y = -\sin 2x$, for $0 \leq x \leq 2\pi$?

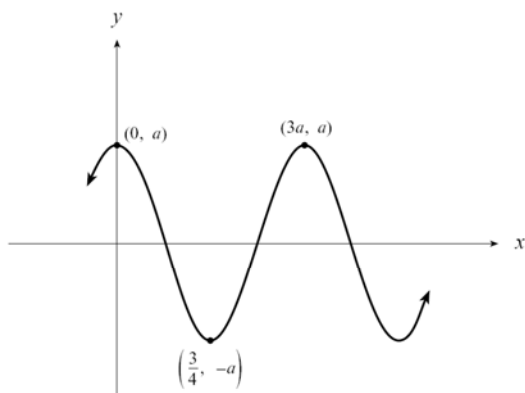


22. Determine the equation of the following sine curve.



- A. $y = a \sin \frac{\pi}{a} x$
 B. $y = a \sin \frac{a}{\pi} x$
 C. $y = \frac{a}{2} \sin \frac{\pi}{a} x$
 D. $y = \frac{a}{2} \sin \frac{2a}{\pi} x$

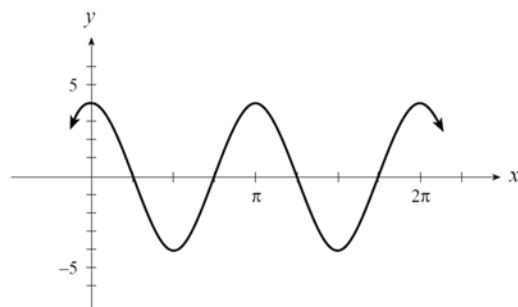
23. Determine the period of the function $y = 5 \sin(3x - \pi)$.
- A. $\frac{\pi}{3}$
 B. $\frac{2\pi}{5}$
 C. $\frac{2\pi}{3}$
 D. 2π
24. A cosine curve has a maximum point at $(3, 20)$ and the nearest minimum point to the right of this point is $(8, 4)$. Which of the following is an equation for this curve?
- A. $y = 8 \cos \frac{2\pi}{5}(x+3) + 12$
 B. $y = 8 \cos \frac{2\pi}{5}(x-3) + 12$
 C. $y = 8 \cos \frac{\pi}{5}(x+3) + 12$
 D. $y = 8 \cos \frac{\pi}{5}(x-3) + 12$
25. Determine the period of the graph of $y = 5 \cos 3\left(x - \frac{\pi}{2}\right)$.
- A. $\frac{2\pi}{5}$
 B. $\frac{2\pi}{3}$
 C. 2π
 D. 6π
26. Determine the period of the function $y = -3 \sin 2x$.
- A. -3
 B. 3
 C. π
 D. 2π
27. Given the graph of $y = a \cos kx$ as shown, determine a .



- A. $\frac{1}{2}$
 B. 1
 C. $\frac{3}{2}$
 D. 3

Determine an equation for the following graph.

28.



A. $y = 4 \cos 2x$

B. $y = 8 \cos 2x$

C. $y = 4 \cos \frac{1}{2}x$

D. $y = 8 \cos \frac{1}{2}x$

29. Which of the given values of b will make the graph of $y = 3 \sin \frac{\pi}{4}(x - b)$ identical to the graph of $y = -3 \cos \frac{\pi}{4}x$?

A. 2

B. 4

C. 6

D. 8

30. The graph of $y = \sin bx$ has a period of $\frac{3\pi}{4}$. Determine a value of the constant b .

A. $\frac{3}{8}$

B. $\frac{3}{4}$

C. $\frac{4}{3}$

D. $\frac{8}{3}$

31. Determine the period of the function $f(x) = 3 \sin 4x + 1$.

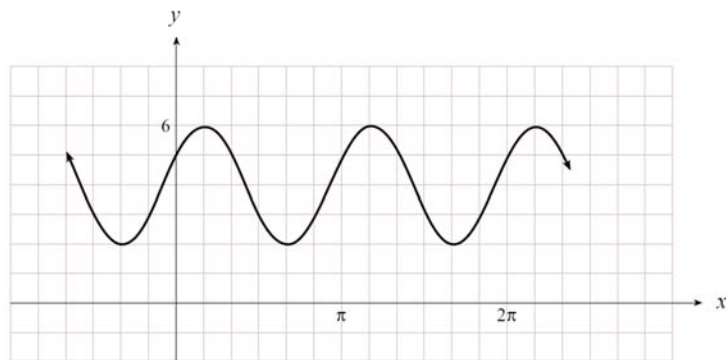
A. $\frac{\pi}{2}$

B. $\frac{2\pi}{3}$

C. 6π

D. 8π

32. Which equation describes the following graph?



A. $y = 2 \cos 2\left(x - \frac{\pi}{6}\right) + 4$

B. $y = 2 \cos 2\left(x + \frac{\pi}{6}\right) + 4$

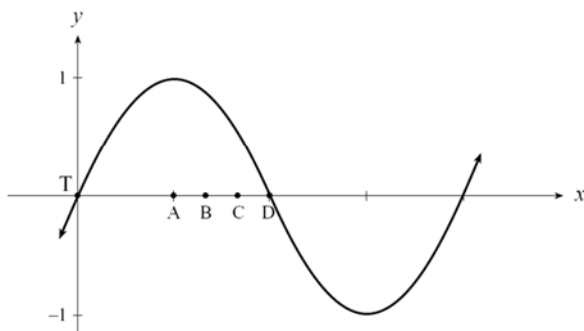
C. $y = 4 \cos\left(x + \frac{\pi}{6}\right) + 2$

D. $y = 4 \cos\left(x - \frac{\pi}{6}\right) + 2$

33. Determine the amplitude of $y = 6\sin 2x + 3$.

A. 2
B. 3
C. 6
D. 12

34. The graph of $y = \sin 5x$ is shown below. To obtain the graph of $y = \sin 5\left(x - \frac{1}{2}\right)$ requires the graph to be shifted. Which point **best** represents the location of point T after the shift?



A. A
B. B
C. C
D. D

35. Given two functions, $f(x) = \sin\left(x - \frac{\pi}{4}\right)$ and $g(x) = \cos(x - a)$, determine the smallest positive value for a so that the graphs are identical.

A. $\frac{\pi}{4}$
B. $\frac{\pi}{2}$
C. $\frac{3\pi}{4}$
D. $\frac{5\pi}{4}$

36. Determine the range of the function $f(x) = -2\cos 3x + 5$.

A. $-7 \leq y \leq -3$
B. $-2 \leq y \leq 5$
C. $-2 \leq y \leq 2$
D. $3 \leq y \leq 7$

37. Determine the smallest positive value for k such that $5\sin \pi(x - k) = -5\cos \pi x$.

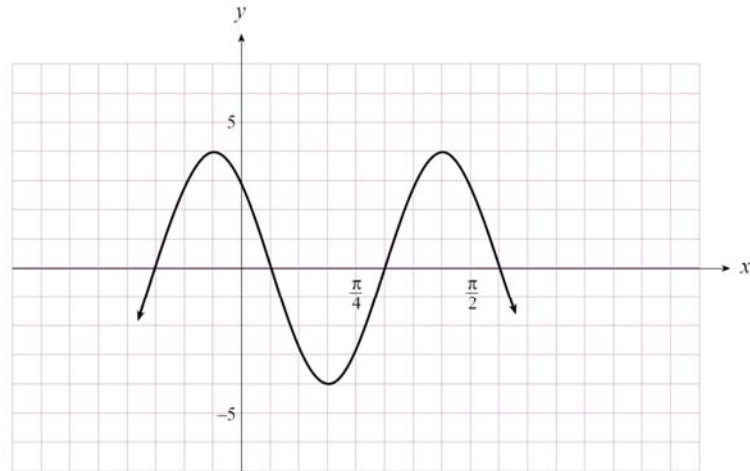
A. $\frac{1}{2}$
B. 1
C. $\frac{\pi}{2}$
D. π

38. Determine the amplitude of the graph of $y = -2\cos 3x$.

A. -2
B. 2
C. 3
D. $\frac{2\pi}{3}$

Which equation describes the following graph?

39.

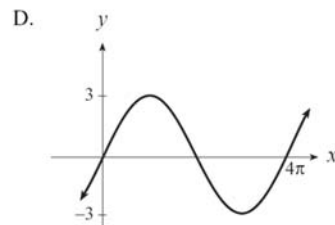
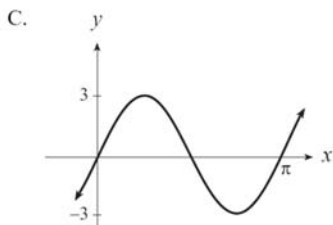
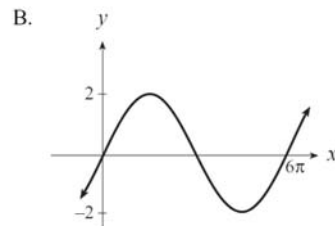
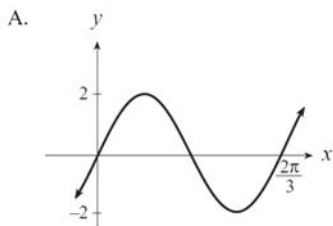


- A. $y = -4 \sin 4 \left(x - \frac{\pi}{16} \right)$
- B. $y = 4 \sin 4 \left(x - \frac{\pi}{16} \right)$
- C. $y = 4 \sin 4 \left(x - \frac{3\pi}{16} \right)$
- D. $y = -4 \sin 4 \left(x + \frac{3\pi}{16} \right)$

40. Determine the phase shift of $y = \cos(2x + 3)$.

- A. 3 units to the left
- B. 3 units to the right
- C. $\frac{3}{2}$ units to the left
- D. $\frac{3}{2}$ units to the right

41. Which graph **best** represents $y = 3 \sin 2x$?



42. Determine the amplitude of the graph of $y = -4 \cos 2x$.

- A. -4
- B. 2
- C. 4
- D. 8

43. Determine the amplitude of the graph of $y = -3 \cos 4x$.

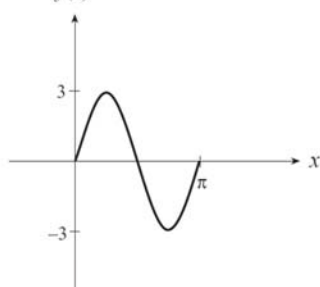
- A. -3
- B. 3
- C. 4
- D. $\frac{\pi}{2}$

44. If the period of the function $y = \sin Bx$ is $\frac{3\pi}{5}$, find B .

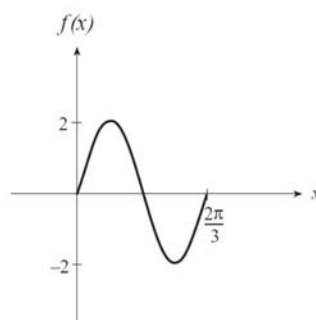
- A. $\frac{2}{15}$
- B. $\frac{3}{10}$
- C. $\frac{10}{3}$
- D. $\frac{15}{2}$

45. Which of the following shows one period of the graph of $f(x) = 2 \sin 3x$?

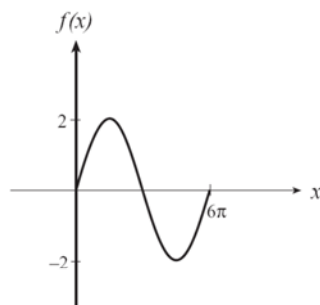
A. $f(x)$



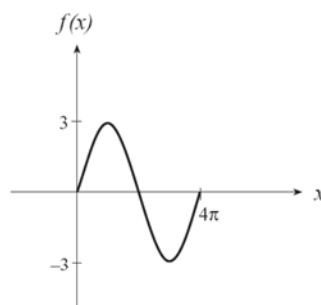
B. $f(x)$



C. $f(x)$



D. $f(x)$



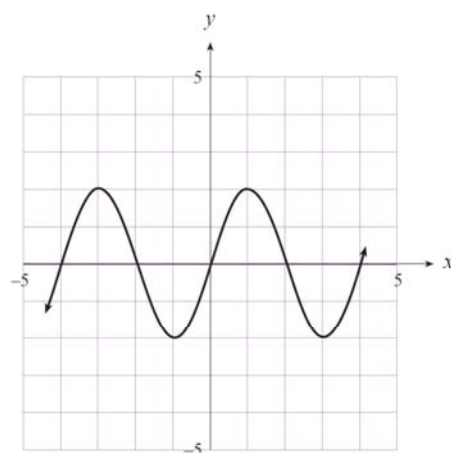
46. Determine the phase shift of the function $y = 2 \cos(3x - 12)$.

- A. 2 to the right
- B. 3 to the right
- C. 4 to the right
- D. 12 to the right

47. Determine the range of the function $y = 5 \cos 2x + 1$.

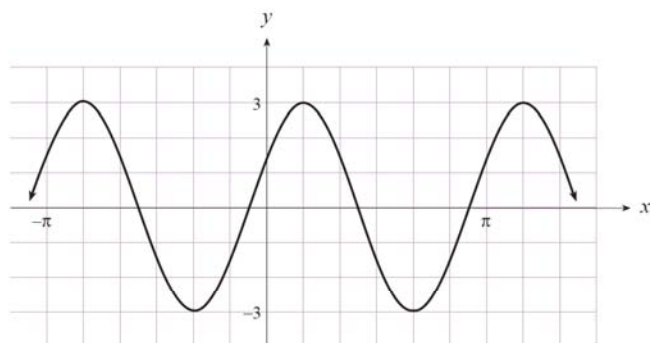
- A. $-5 \leq y \leq 5$
- B. $-4 \leq y \leq 6$
- C. $-2 \leq y \leq 2$
- D. $-1 \leq y \leq 3$

48. Determine an equation of the sine function graphed below.



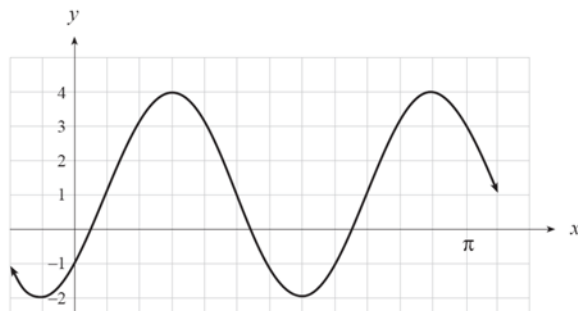
- A. $y = \sin \pi x$
- B. $y = 2 \sin \pi x$
- C. $y = \sin \frac{\pi}{2} x$
- D. $y = 2 \sin \frac{\pi}{2} x$
49. Determine the maximum value of the function $y = 3 \cos 2x - 4$.
- A. -2
- B. -1
- C. 3
- D. 7
50. A sine curve has a zero at -2 . The nearest zero to the right is at 3 . A maximum point is located between these zeros. If the range of the function is $-1 \leq y \leq 1$, determine an equation of this function.
- A. $y = \sin \frac{\pi}{5}(x - 2)$
- B. $y = \sin \frac{2\pi}{5}(x - 2)$
- C. $y = \sin \frac{2\pi}{5}(x + 2)$
- D. $y = \sin \frac{\pi}{5}(x + 2)$
51. Determine the amplitude of the function $y = -5 \cos 4x$.
- A. -5
- B. -4
- C. 4
- D. 5
52. What is the period of the function $y = \sin \frac{1}{2} x$?
- A. $\frac{\pi}{2}$
- B. π
- C. 2π
- D. 4π
53. The height of a piston in an engine can be determined by the function $h = 20 \sin \frac{\pi t}{0.025} + 20$, where height, h , is in centimetres, and time, t , is in seconds. Determine the period of this function.
- A. 0.025
- B. 0.05
- C. 0.25
- D. 0.5

54. Determine an equation of the cosine function graphed below.

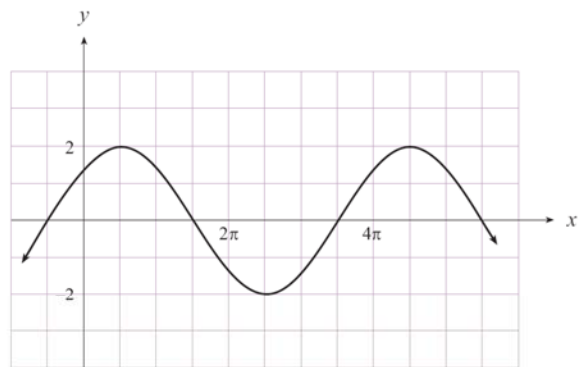


- A. $y = 3 \cos 2\left(x - \frac{\pi}{6}\right)$
B. $y = 3 \cos 2\left(x + \frac{\pi}{6}\right)$
C. $y = 3 \cos 2(x - 1)$
D. $y = 3 \cos 2(x + 1)$
- 55.
56. Determine the range of the trigonometric function $y = -5 \cos(x + 2)$.
- A. $-7 \leq y \leq 3$
B. $-5 \leq y \leq 5$
C. $-3 \leq y \leq 7$
D. $3 \leq y \leq 7$
57. Determine the phase shift of the function $y = 4 \cos 2\left(x - \frac{\pi}{4}\right) + 5$.
- A. $\frac{\pi}{4}$ to the right
B. $\frac{\pi}{2}$ to the right
C. $\frac{\pi}{4}$ to the left
D. $\frac{\pi}{2}$ to the left

The equation of the graph is
 $y = a \cos b(x - c) + d$, where a , b , c and d are all positive.



58. In the graph above, determine the value of d .
- 1
 - 2
 - 3
 - 4
59. In the graph above, determine the value of a .
- 1
 - 2
 - 3
 - 4
60. In the graph above, determine the value of b .
- $\frac{2}{3}$
 - 3
 - 4
 - 8
61. Which cosine function represents the following graph?



- $y = 2 \cos \frac{1}{2} \left(x - \frac{\pi}{2} \right)$
 - $y = 2 \cos \frac{1}{2} \left(x + \frac{\pi}{2} \right)$
 - $y = 2 \cos 2 \left(x - \frac{\pi}{2} \right)$
 - $y = 2 \cos 2 \left(x + \frac{\pi}{2} \right)$
62. A sine function has a maximum point at $(4, 32)$ and the nearest minimum point to the right is $(16, 18)$. Determine an equation for this function.
- $y = 7 \sin \frac{\pi}{6} (x - 4) + 25$
 - $y = 7 \sin \frac{\pi}{6} (x + 4) + 25$
 - $y = 7 \sin \frac{\pi}{12} (x - 2) + 25$
 - $y = 7 \sin \frac{\pi}{12} (x + 2) + 25$

63. What is the amplitude of $f(x) = -3 \cos(4x + \pi) + 2$?

- A. -3
- B. 2
- C. 3
- D. 4

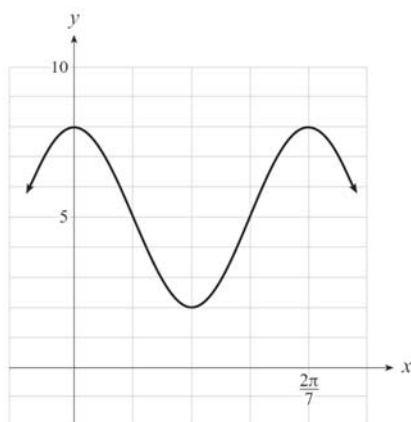
64. Determine the amplitude of $y = -2 \sin 3(x - 5)$.

- A. -2
- B. 2
- C. 3
- D. 5

65. What is the phase shift of $f(x) = 2 \sin(3x + \pi) + 6$?

- A. $\frac{\pi}{3}$ to the left
- B. $\frac{\pi}{2}$ to the left
- C. $\frac{2\pi}{3}$ to the left
- D. π to the left

66. Determine an equation of the cosine function graphed below.



- A. $y = 3 \cos 7x + 2$
- B. $y = 3 \cos 7x + 5$
- C. $y = 6 \cos 7x + 5$
- D. $y = 8 \cos 7x + 2$

67. Determine the phase shift of $y = -4 \sin(2x - 6)$.

- A. 2 to the right
- B. 3 to the right
- C. 4 to the right
- D. 6 to the right

68. Which equation represents the same graph as $y = 3 \cos\left(x - \frac{\pi}{4}\right)$?

- A. $y = 3 \sin\left(x - \frac{\pi}{4}\right)$
- B. $y = 3 \sin\left(x + \frac{3\pi}{4}\right)$
- C. $y = -3 \sin\left(x + \frac{\pi}{4}\right)$
- D. $y = -3 \sin\left(x - \frac{3\pi}{4}\right)$

KEY

- 1) B
- 2) C
- 3) C
- 4) D
- 5) C
- 6) C
- 7) A
- 8) B
- 9) D
- 10) A
- 11) A
- 12) C
- 13) D
- 14) B
- 15) D
- 16) A
- 17) C
- 18) A
- 19) B
- 20) C
- 21) B
- 22) A
- 23) C

- 24) D
- 25) B
- 26) C
- 27) A
- 28) A
- 29) A
- 30) D
- 31) A
- 32) A
- 33) C
- 34) C
- 35) C
- 36) D
- 37) A
- 38) B
- 39) A
- 40) C
- 41) C
- 42) C
- 43) B
- 44) C
- 45) B
- 46) C

- 47) B
- 48) D
- 49) B
- 50) D
- 51) D
- 52) D
- 53) B
- 54) A
- 55) B
- 56) B
- 57) A
- 58) A
- 59) C
- 60) A
- 61) A
- 62) D
- 63) C
- 64) B
- 65) A
- 66) B
- 67) B
- 68) D