

**SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.**

**Find the exact value of the indicated trigonometric function of  $\theta$ .**

1)  $\cos \theta = \frac{2}{9}$ ,  $\tan \theta < 0$  Find  $\sin \theta$ . 1) \_\_\_\_\_

2)  $\csc \theta = -\frac{7}{4}$ ,  $\theta$  in quadrant III Find  $\cot \theta$ . 2) \_\_\_\_\_

3)  $\cos \theta = \frac{20}{29}$ ,  $\frac{3\pi}{2} < \theta < 2\pi$  Find  $\cot \theta$ . 3) \_\_\_\_\_

**Find the reference angle for the given angle.**

4)  $-64^\circ$  4) \_\_\_\_\_

5)  $-\frac{2\pi}{3}$  5) \_\_\_\_\_

**Use reference angles to find the exact value of the expression. Do not use a calculator.**

6)  $\csc \frac{4\pi}{3}$  6) \_\_\_\_\_

7)  $\tan \frac{7\pi}{6}$  7) \_\_\_\_\_

8)  $\sin \frac{4\pi}{3}$  8) \_\_\_\_\_

9)  $\sec \frac{-5\pi}{4}$  9) \_\_\_\_\_

**Determine the amplitude or period as requested.**

10) Amplitude of  $y = 2 \sin 5x$  10) \_\_\_\_\_

11) Period of  $y = -4 \sin 6\pi x$  11) \_\_\_\_\_

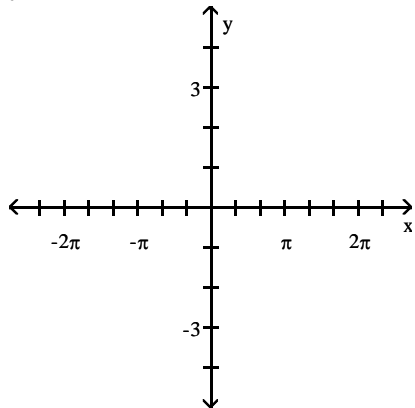
**Determine the phase shift of the function.**

12)  $y = 5 \sin \left( 4x - \frac{\pi}{2} \right)$  12) \_\_\_\_\_

Graph the function, Identify the amplitude, period and phase shift (if any) .

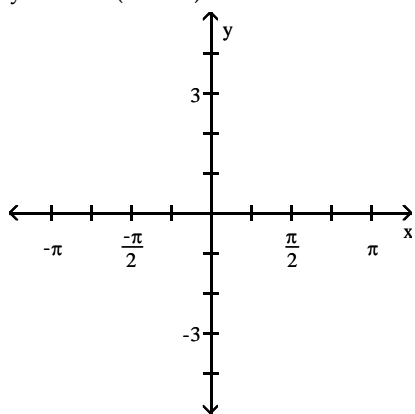
13)  $y = -3 \sin 3x$

13) \_\_\_\_\_



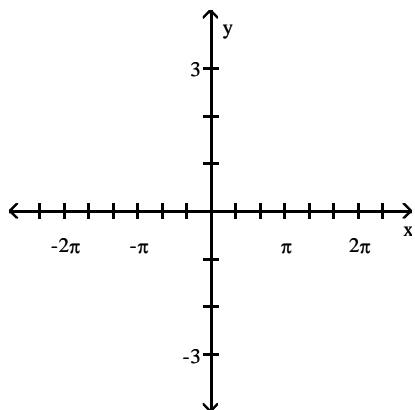
14)  $y = 3 \sin (2x + \pi)$

14) \_\_\_\_\_



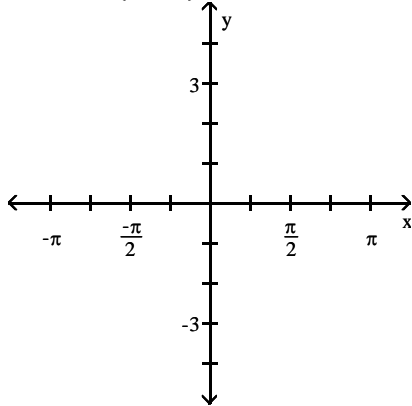
15)  $y = 2 \cos 3x$

15) \_\_\_\_\_



16)  $y = 4 \cos\left(x - \frac{\pi}{4}\right)$

16) \_\_\_\_\_

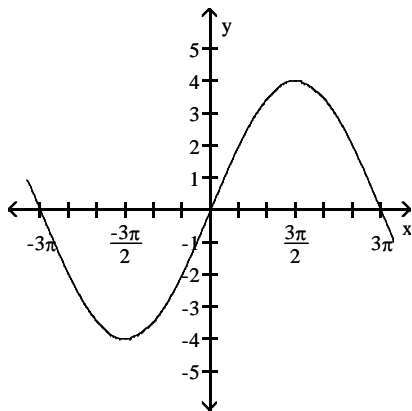


**MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.**

**Find an equation for the graph.**

17)

17) \_\_\_\_\_



A)  $y = 3 \sin 4x$

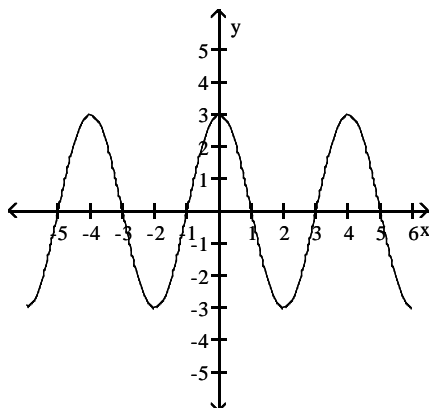
B)  $y = 4 \sin 3x$

C)  $y = 3 \sin \frac{1}{4}x$

D)  $y = 4 \sin \frac{1}{3}x$

18)

18) \_\_\_\_\_



A)  $y = 3 \cos \frac{\pi}{2}x$

B)  $y = 3 \cos 2\pi x$

C)  $y = 2 \cos \frac{\pi}{3}x$

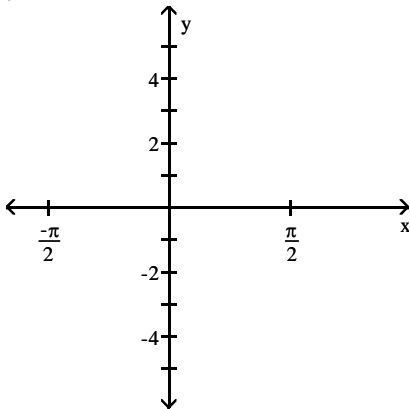
D)  $y = 2 \cos 3\pi x$

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Graph the function.

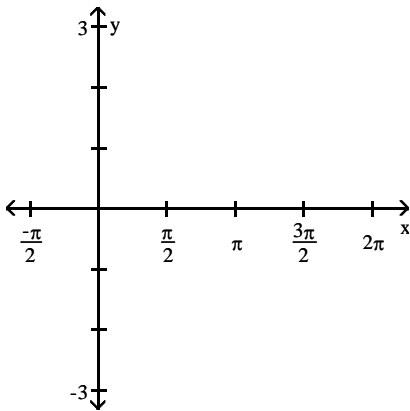
19)  $y = 2 \tan 4x$

19) \_\_\_\_\_



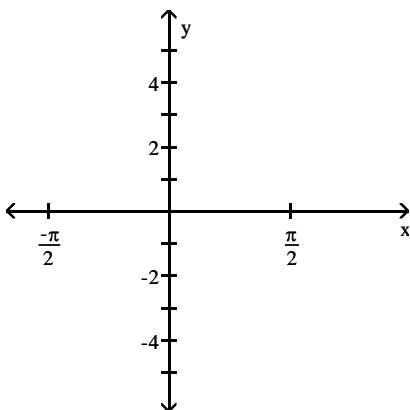
20)  $y = -\tan(x - \pi)$

20) \_\_\_\_\_



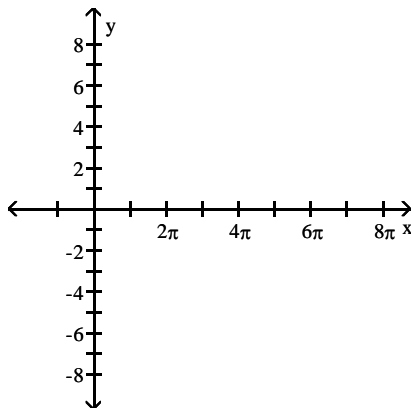
21)  $y = 4 \cot 2x$

21) \_\_\_\_\_



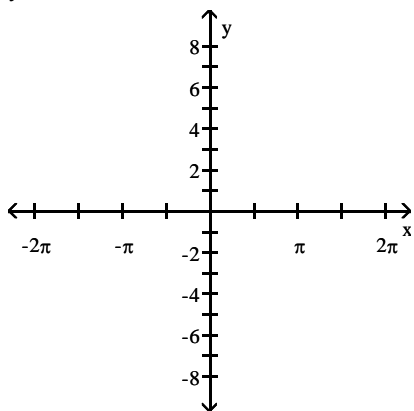
22)  $y = 3 \csc \frac{x}{4}$

22) \_\_\_\_\_



23)  $y = 3 \sec x$

23) \_\_\_\_\_



**Find the exact value of the expression.**

24)  $\sin^{-1} \frac{\sqrt{3}}{2}$

24) \_\_\_\_\_

25)  $\cos^{-1} \left( -\frac{\sqrt{2}}{2} \right)$

25) \_\_\_\_\_

26)  $\tan^{-1} (1)$

26) \_\_\_\_\_

**Find the exact value of the expression, if possible. Do not use a calculator.**

27)  $\cos^{-1} (\cos \pi)$

27) \_\_\_\_\_

28)  $\cos^{-1} \left[ \cos \left( -\frac{\pi}{3} \right) \right]$

28) \_\_\_\_\_

**Use a sketch to find the exact value of the expression.**

29)  $\cos \left( \sin^{-1} \frac{3}{5} \right)$

29) \_\_\_\_\_

$$30) \csc\left(\tan^{-1}\frac{\sqrt{3}}{3}\right)$$

30) \_\_\_\_\_

Use a right triangle to write the expression as an algebraic expression. Assume that  $x$  is positive and in the domain of the given inverse trigonometric function.

$$31) \cos(\tan^{-1} x)$$

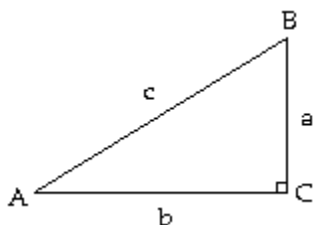
31) \_\_\_\_\_

Solve the problem.

- 32) From a boat on the river below a dam, the angle of elevation to the top of the dam is  $22^\circ 23'$ . If the dam is 2457 feet above the level of the river, how far is the boat from the base of the dam (to the nearest foot)?

32) \_\_\_\_\_

Solve the right triangle shown in the figure. Round lengths to one decimal place and express angles to the nearest tenth of degree.



$$33) b = 130, c = 390$$

33) \_\_\_\_\_

Using a calculator, solve the following problems. Round your answers to the nearest tenth.

- 34) A boat leaves the entrance of a harbor and travels 16 miles on a bearing of  $N 22^\circ E$ . How many miles north and how many miles east from the harbor has the boat traveled?

34) \_\_\_\_\_

- 35) A ship is 50 miles west and 31 miles south of a harbor. What bearing should the captain set to sail directly to harbor?

35) \_\_\_\_\_

An object is attached to a coiled spring. The object is pulled down (negative direction from the rest position) and then released. Write an equation for the distance of the object from its rest position after  $t$  seconds.

$$36) \text{amplitude} = 8 \text{ cm; period} = 5 \text{ seconds}$$

36) \_\_\_\_\_

Solve the problem.

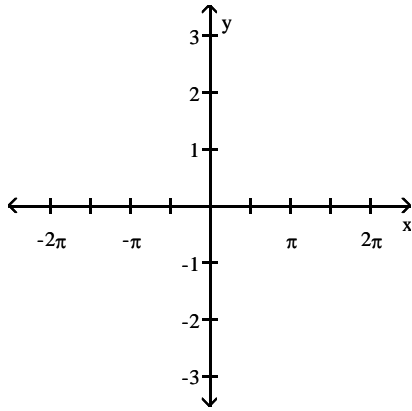
- 37) An object has a frequency of 5 vibrations per second. Write an equation in the form  $d = \sin \omega t$  for the object's simple harmonic motion.

37) \_\_\_\_\_

Use a vertical shift to graph the function.

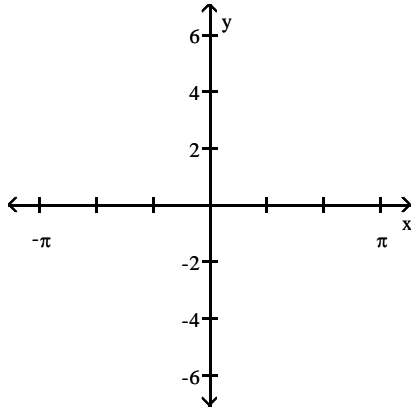
38)  $y = 2 + \sin x$

38) \_\_\_\_\_



39)  $y = -4 \sin \left( 2x + \frac{\pi}{2} \right) - 2$

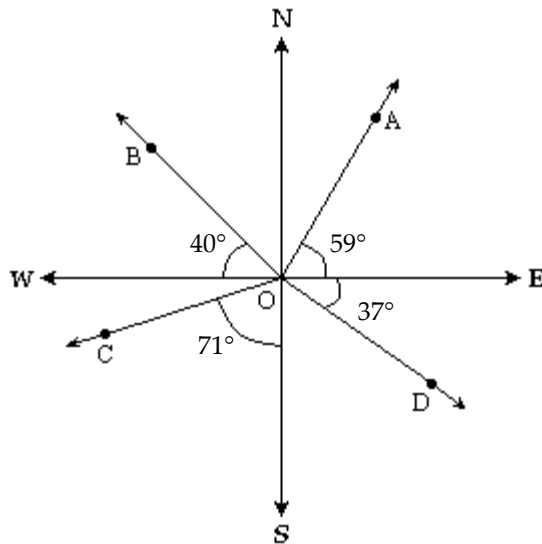
39) \_\_\_\_\_



Use the given figure to solve the problem.

40) Find the bearing from O to C., O to D, and O to B.

40) \_\_\_\_\_



**Using a calculator, solve the following problems. Round your answers to the nearest tenth.**

41) A ship leaves port with a bearing of N  $74^\circ$  W. After traveling 25 miles, the ship then turns  $90^\circ$  and travels on a bearing of S  $16^\circ$  W for 13 miles. At that time, what is the bearing of the ship from port? 41) \_\_\_\_\_

42) A ship leaves port with a bearing of N  $48^\circ$  E. After traveling 28 miles, the ship then turns  $90^\circ$  and travels on a bearing of S  $42^\circ$  E for 11 miles. At that time, what is the bearing of the ship from port? 42) \_\_\_\_\_



Answer Key

Testname: CHAPTER 4 PART 2 REVIEW (2)

1)  $-\frac{\sqrt{77}}{9}$

2)  $\frac{\sqrt{33}}{4}$

3)  $-\frac{20}{21}$

4)  $64^\circ$

5)  $\frac{\pi}{3}$

6)  $-\frac{2\sqrt{3}}{3}$

7)  $\frac{\sqrt{3}}{3}$

8)  $-\frac{\sqrt{3}}{2}$

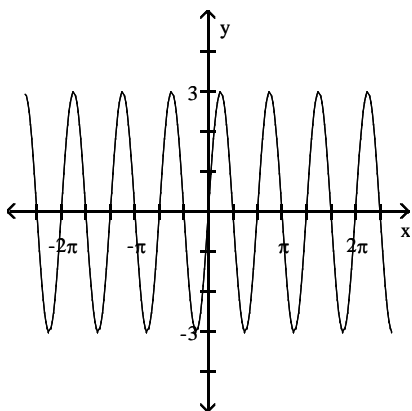
9)  $-\sqrt{2}$

10) 2

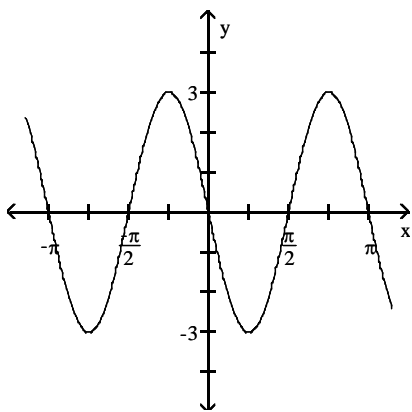
11)  $\frac{1}{3}$

12)  $\frac{\pi}{8}$  units to the right

13)



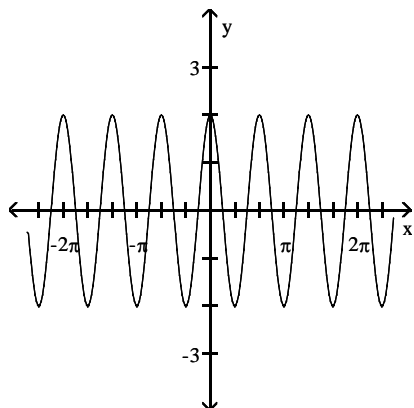
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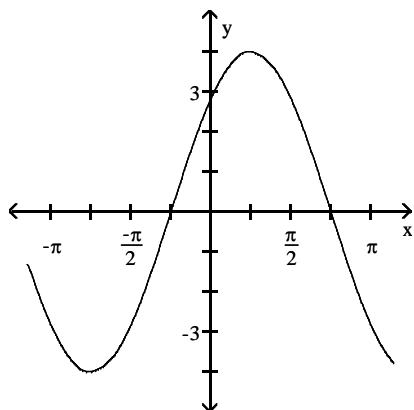
Answer Key

Testname: CHAPTER 4 PART 2 REVIEW (2)

15)



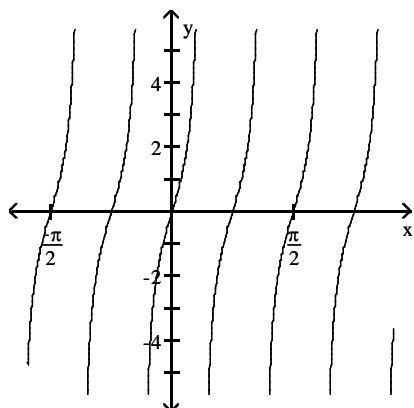
16)



17) D

18) A

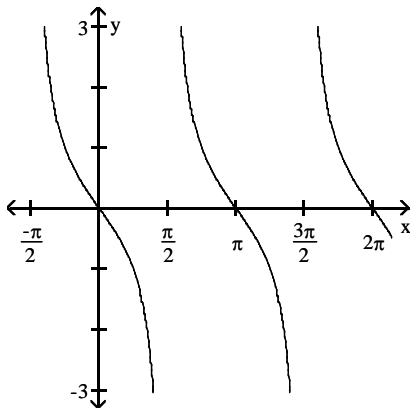
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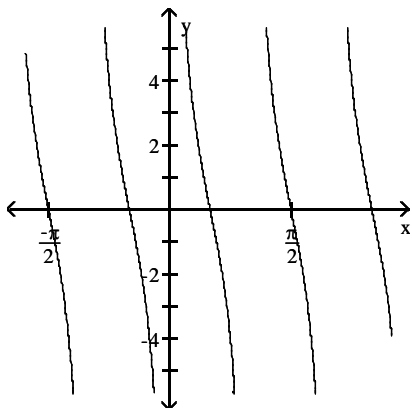
Answer Key

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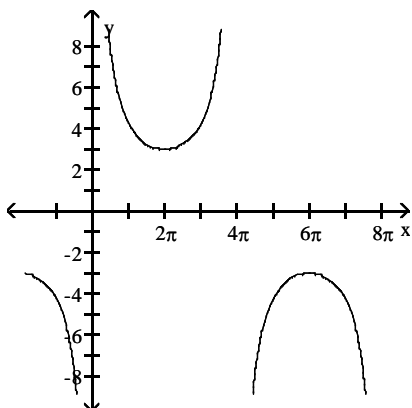
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21)



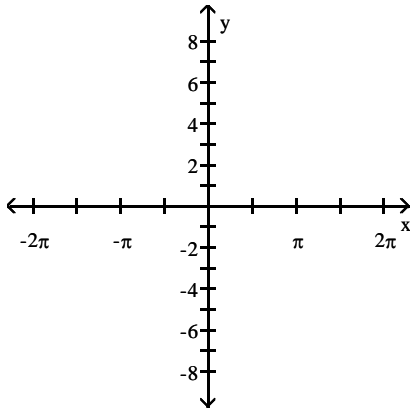
22)



Answer Key

Testname: CHAPTER 4 PART 2 REVIEW (2)

23)



24)  $\frac{\pi}{3}$

25)  $\frac{3\pi}{4}$

26)  $\frac{\pi}{4}$

27)  $\pi$

28)  $\frac{\pi}{3}$

29)  $\frac{4}{5}$

30) 2

31)  $\frac{\sqrt{x^2 + 1}}{x^2 + 1}$

32) 5966 feet

33)  $A = 70.5^\circ$ ,  $B = 19.5^\circ$ ,  $a = 367.7$

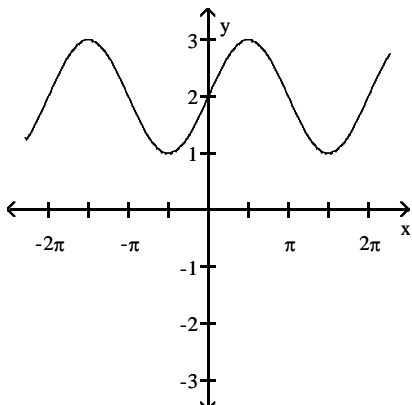
34) 14.8 miles north and 6 miles east

35)  $N 58.2^\circ E$

36)  $d = -8 \cos \frac{2}{5} \pi t$

37)  $d = \sin 10\pi t$

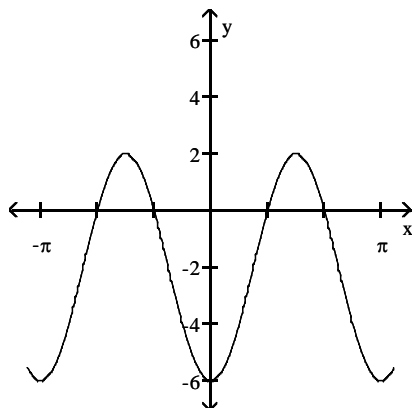
38)



Answer Key

Testname: CHAPTER 4 PART 2 REVIEW (2)

39)



- 40) S  $71^\circ$  W
- 41) N  $101.5^\circ$  W
- 42) N  $69.4^\circ$  W