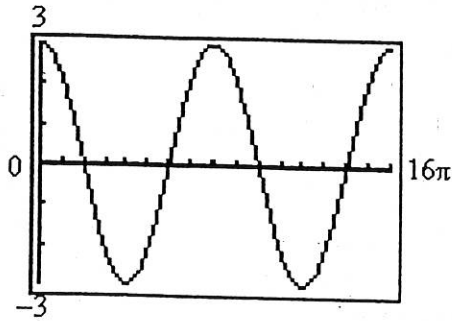


Answer the question.

1) Which one of the equations below matches the graph?



- A)  $y = 3 \cos\left(\frac{1}{4}x\right)$       B)  $y = -3 \sin(4x)$       C)  $y = 3 \sin\left(\frac{1}{4}x\right)$       D)  $y = 3 \cos(4x)$

1) \_\_\_\_\_

Name the quadrant in which the angle  $\theta$  lies.

2)  $\tan \theta < 0, \sin \theta < 0$

- A) I      B) II      C) III      D) IV

2) \_\_\_\_\_

In the problem,  $\sin \theta$  and  $\cos \theta$  are given. Find the exact value of the indicated trigonometric function.

3)  $\sin \theta = \frac{\sqrt{7}}{4}, \cos \theta = \frac{3}{4}$  Find  $\csc \theta$ .

- A)  $\frac{\sqrt{7}}{3}$       B)  $\frac{3\sqrt{7}}{7}$       C)  $\frac{4}{3}$       D)  $\frac{4\sqrt{7}}{7}$

3) \_\_\_\_\_

Solve the problem.

4) For what numbers  $\theta$  is  $f(\theta) = \tan \theta$  not defined?

- A) integral multiples of  $\pi$  ( $180^\circ$ )      B) odd multiples of  $\pi$  ( $180^\circ$ )  
 C) odd multiples of  $\frac{\pi}{2}$  ( $90^\circ$ )      D) all real numbers

4) \_\_\_\_\_

5) What is the range of the sine function?

- A) all real numbers greater than or equal to 1 or less than or equal to -1  
 B) all real numbers greater than or equal to 0  
 C) all real numbers  
 D) all real numbers from -1 to 1, inclusive

5) \_\_\_\_\_

6) For what numbers  $x, -2\pi \leq x \leq 2\pi$ , does the graph of  $y = \csc x$  have vertical asymptotes?

- A)  $-2\pi, -\pi, 0, \pi, 2\pi$       B)  $-2, -1, 0, 1, 2$       C)  $-\frac{3\pi}{2}, -\frac{\pi}{2}, \frac{\pi}{2}, \frac{3\pi}{2}$       D) none

6) \_\_\_\_\_

7) For what numbers  $x, -2\pi \leq x \leq 2\pi$ , does  $\sec x = -1$ ?

- A)  $-\pi, \pi$       B)  $-2\pi, 0, 2\pi$       C)  $-\frac{\pi}{2}, \frac{3\pi}{2}$       D) none

7) \_\_\_\_\_

8) For what numbers  $x$ ,  $0 \leq x \leq 2\pi$ , does  $\sin x = 1$ ?

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

B)  $0, 2\pi$

C)  $\frac{\pi}{2}, \frac{3\pi}{2}$

D) none

8) \_\_\_\_\_

Write the equation of a sine function that has the given characteristics.

9) Amplitude: 5

Period:  $\pi$

Phase Shift:  $\frac{3}{2}$

A)  $y = 5 \sin \left( 2x + \frac{3}{2} \right)$

B)  $y = 5 \sin (2x - 3)$

C)  $y = 5 \sin \left( \frac{1}{2}x - 6 \right)$

D)  $y = \sin (5x + 3)$

9) \_\_\_\_\_

Convert the angle to a decimal in degrees. Round the answer to two decimal places.

10)  $21^\circ 17' 34''$

10) \_\_\_\_\_

Convert the angle to  $D^\circ M' S''$  form. Round the answer to the nearest second.

11)  $81.96^\circ$

11) \_\_\_\_\_

If  $s$  denotes the length of the arc of a circle of radius  $r$  subtended by a central angle  $\theta$ , find the missing quantity.

12)  $s = 4.62$  meters,  $\theta = 1.4$  radians,  $r = ?$

12) \_\_\_\_\_

Solve the problem.

13) The minute hand of a clock is 4 inches long. How far does the tip of the minute hand move in 45 minutes? If necessary, round the answer to two decimal places.

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

Convert the angle in degrees to radians. Express the answer as multiple of  $\pi$ .

14)  $6^\circ$

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

Convert the angle in radians to degrees.

15)  $\frac{11\pi}{12}$

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

If  $A$  denotes the area of the sector of a circle of radius  $r$  formed by the central angle  $\theta$ , find the missing quantity. If necessary, round the answer to two decimal places.

16)  $\theta = \frac{\pi}{3}$  radians,  $A = 58$  square meters,  $r = ?$

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

Solve the problem.

17) A gear with a radius of 2 centimeters is turning at  $\frac{\pi}{9}$  radians/sec. What is the linear speed at a point on the outer edge of the gear?

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

Find the exact value. Do not use a calculator.

18)  $\tan (39\pi)$

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

19)  $\cot 2\pi$

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

20)  $\sin \pi$

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

21)  $\cot 750^\circ$

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

22)  $\sec \frac{13\pi}{4}$

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

Use the even-odd properties to find the exact value of the expression. Do not use a calculator.

23)  $\tan(-30^\circ)$

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

24)  $\sin(-120^\circ)$

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

25)  $\cot\left(-\frac{\pi}{4}\right)$

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

Use the fact that the trigonometric functions are periodic to find the exact value of the expression. Do not use a calculator.

26)  $\cos \frac{10\pi}{3}$

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

27)  $\cot \frac{21\pi}{4}$

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

Find the exact value of the expression. Do not use a calculator.

28)  $\sin 330^\circ \sin 270^\circ$

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

29)  $\cot \frac{\pi}{3} - \sin \frac{\pi}{3}$

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

Use a calculator to find the approximate value of the expression rounded to two decimal places.

30)  $\csc 31^\circ$

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

31)  $\cot 0.1845$

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

A point on the terminal side of an angle  $\theta$  is given. Find the exact value of the indicated trigonometric function of  $\theta$ .

32)  $(-5, -12)$  Find  $\sin \theta$ .

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

33)  $(3, 2)$  Find  $\tan \theta$ .

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

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

34)  $\cos \theta = \frac{21}{29}, \frac{3\pi}{2} < \theta < 2\pi$  Find  $\cot \theta$ .

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

35)  $\sin \theta = -\frac{2}{9}, \tan \theta > 0$  Find  $\sec \theta$ .

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

Solve the problem.

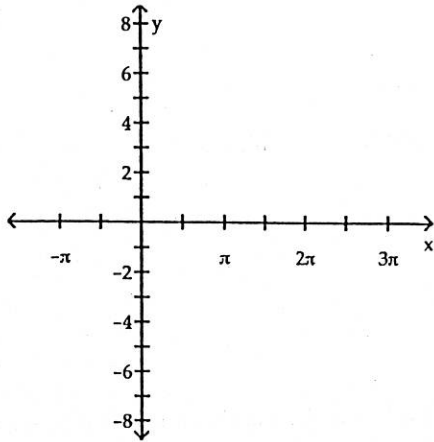
36) For the equation  $y = -\frac{1}{2} \sin(4x + 3\pi)$ , identify (i) the amplitude, (ii) the phase shift, and (iii) the period.

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

Graph the function. Show at least one period.

37)  $y = 3 \sin(4x - \pi)$

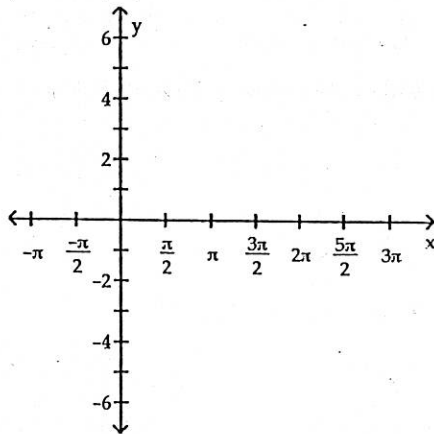
37)



Graph the function.

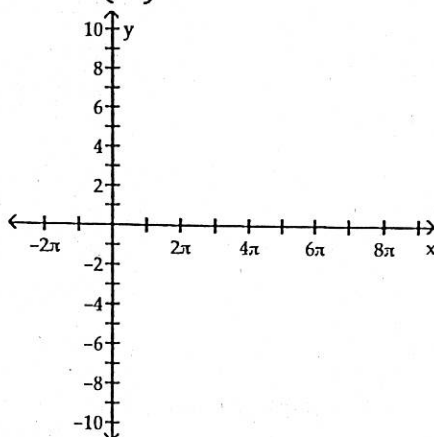
38)  $y = -\cot(\pi x)$

38)



39)  $y = 4 \sec\left(\frac{1}{2}x\right)$

39)

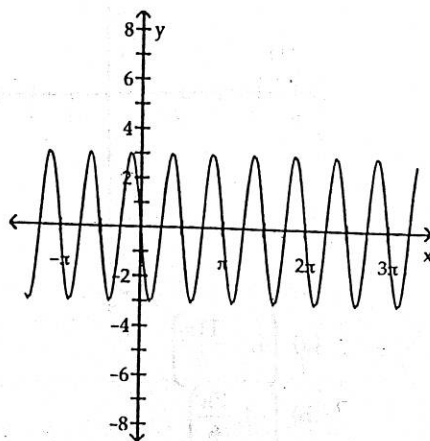


Answers to Chapter 5 Final Exam Review Questions

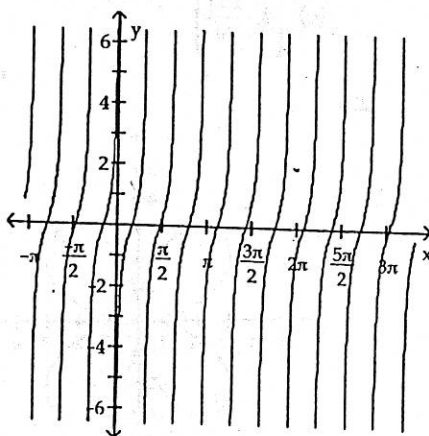
- 1) A
- 2) D
- 3) D
- 4) C
- 5) D
- 6) A
- 7) A
- 8) A
- 9) B
- 10)  $21.29^\circ$
- 11)  $81^\circ 57' 36''$
- 12) 3.3 m
- 13) 18.85 in.
- 14)  $\frac{\pi}{30}$
- 15)  $165^\circ$
- 16) 10.52 m
- 17)  $\frac{2\pi}{9}$  cm/sec
- 18) 0
- 19) undefined
- 20) 0
- 21)  $\sqrt{3}$
- 22)  $-\sqrt{2}$
- 23)  $-\frac{\sqrt{3}}{3}$
- 24)  $-\frac{\sqrt{3}}{2}$
- 25) -1
- 26)  $-\frac{1}{2}$
- 27) 1
- 28)  $\frac{1}{2}$
- 29)  $-\frac{\sqrt{3}}{6}$
- 30) 1.94
- 31) 5.36
- 32)  $-\frac{12}{13}$
- 33)  $\frac{2}{3}$
- 34)  $-\frac{21}{20}$
- 35)  $-\frac{9\sqrt{77}}{77}$

36) (i)  $\frac{1}{2}$       (ii)  $-\frac{3\pi}{4}$       (iii)  $\frac{\pi}{2}$

37)



38)



39)

