

8	Find values of trigonometric ratios by using reference angles.	Exercises (28-39)	P432
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28. $\frac{31\pi}{36}$ What is the reference angle? A. $\frac{5\pi}{36}$ B. $\frac{\pi}{6}$ C. $\frac{13\pi}{36}$ D. $\frac{7\pi}{18}$	29. 230° What is the reference angle? A. 50° B. 40° C. 45° D. 60°
30. 205° What is the reference angle? A. 25° B. 35° C. 45° D. 55°	31. $\frac{4\pi}{3}$ What is the reference angle? A. $\frac{\pi}{3}$ B. $\frac{2\pi}{3}$ C. $\frac{\pi}{6}$ D. $\frac{5\pi}{6}$
32. $-\frac{\pi}{6}$ What is the reference angle? A. $\frac{\pi}{3}$ B. $\frac{\pi}{6}$ C. $\frac{5\pi}{6}$ D. $\frac{2\pi}{3}$	33. $\frac{7\pi}{4}$ What is the reference angle? A. $\frac{\pi}{4}$ B. $\frac{3\pi}{4}$ C. $\frac{5\pi}{4}$ D. $\frac{7\pi}{8}$
34. 135° What is the reference angle? A. 35° B. 45° C. 55° D. 65°	35. 200° What is the reference angle? A. 10° B. 20° C. 30° D. 40°

36. $\frac{5\pi}{3}$ What is the reference angle? A. $\frac{\pi}{3}$ B. $\frac{2\pi}{3}$ C. $\frac{5\pi}{6}$ D. $\frac{\pi}{6}$	37. $\frac{13\pi}{8}$ What is the reference angle? A. $\frac{5\pi}{8}$ B. $\frac{\pi}{8}$ C. $\frac{3\pi}{8}$ D. $\frac{\pi}{4}$
38. -210° What is the reference angle? A. 30° B. 40° C. 50° D. 60°	39. $-\frac{7\pi}{4}$ What is the reference angle? A. $\frac{\pi}{4}$ B. $\frac{3\pi}{4}$ C. $\frac{5\pi}{4}$ D. $\frac{7\pi}{8}$

9

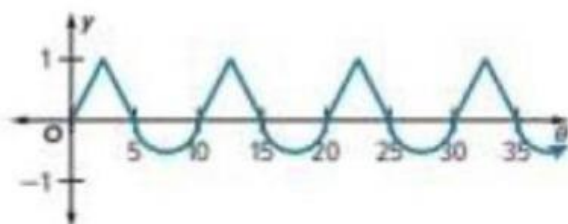
Find values of trigonometric functions that model periodic events..

Exercises (13-18)

P441

Determine the period of the function.

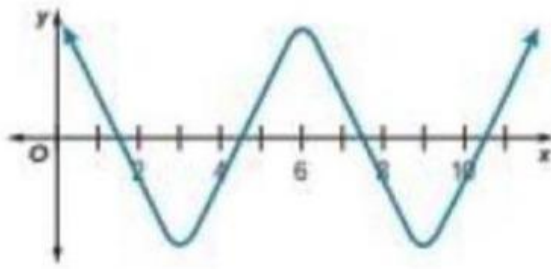
13.



- A) 5
- B) 10
- C) 15
- D) 35

Determine the period of the function.

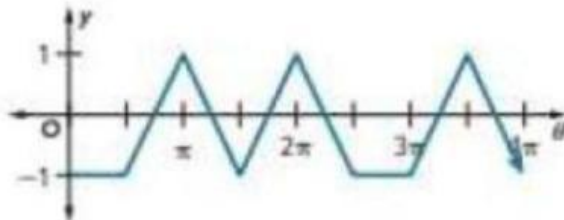
14.



- A) 3
- B) 6
- C) 9
- D) 8

Determine the period of the function.

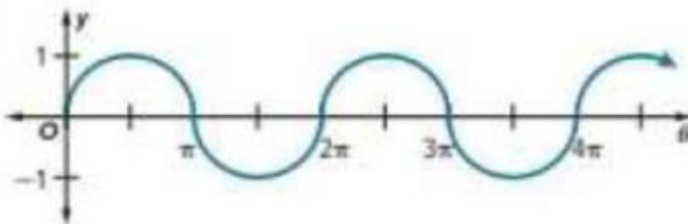
15.



- A) π
- B) 1.5π
- C) 2π
- D) 2.5π

Determine the period of the function.

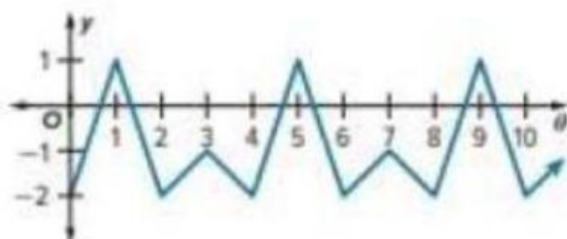
16.



- A) π
- B) 2π
- C) 3π
- D) 4π

Determine the period of the function.

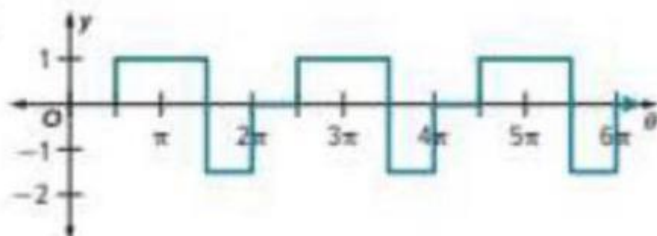
17.



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

Determine the period of the function.

18.



- A) 0.5π
- B) π
- C) 2π
- D) 2.5π

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Use the properties of periodic functions to evaluate trigonometric functions.

Exercises (21-26)

P442

21. $\sin(-510^\circ)$

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

22. $\sin(495^\circ)$

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

23. $\cos\left(-\frac{5\pi}{2}\right)$

- A. 0
- B. 1
- C. -1
- D. $\frac{\sqrt{2}}{2}$

24. $\sin\left(\frac{5\pi}{3}\right)$

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

25. $\cos\left(\frac{11\pi}{4}\right)$

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

26. $\sin\left(-\frac{3\pi}{4}\right)$

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

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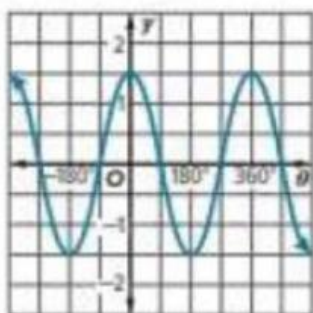
Describe and graph the sine, cosine, and tangent functions

Exercises (24-26)

P452

For each graph, identify the period and write an equation.

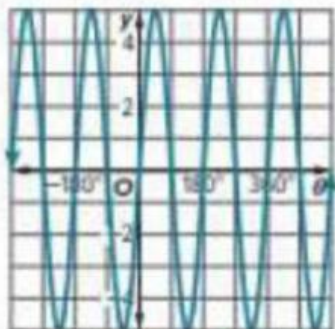
24.



- A) Period 360 , $y = 1.5 \cos \theta$
 B) Period 360 , $y = 1.5 \sin \theta$
 C) Period 180 , $y = 1.5 \cos 2 \theta$
 D) Period 360 , $y = 3 \cos 2 \theta$

For each graph, identify the period and write an equation.

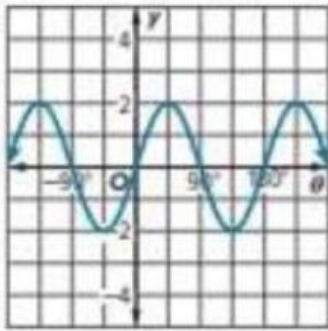
25.



- A) Period 360 , $y = 5 \cos \theta$
 B) Period 360 , $y = 5 \sin \theta$
 C) Period 180 , $y = 5 \cos 2 \theta$
 D) Period 180 , $y = 5 \sin 2 \theta$

For each graph, identify the period and write an equation.

26.



- A) Period 180 , $y = 2 \cos \theta$
- B) Period 180 , $y = 2 \sin \theta$
- C) Period 180 , $y = 2 \sin 2\theta$
- D) Period 180 , $y = 2 \cos 2\theta$

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Model periodic realworld situations with sine and cosine functions.

Exercises (19-20)

P452

Example 6

- 19. REASONING** A boat that is tied to a dock moves vertically up and down with the waves. Delray watches the boat for 30 seconds and notes that the boat moves up and down a total of 6 times. The difference between the boat's highest point and lowest point is 3 feet. Write and graph a trigonometric function that models the boat's vertical position x seconds after she began watching. Assume that when Delray began watching the boat, it was at its highest point and that its average vertical position was 0 feet.

- A. $y = \frac{3}{2} \cos \left(\frac{\pi}{5} x \right)$
- B. $y = 3 \cos \left(\frac{2\pi}{5} x \right)$
- C. $y = \frac{3}{2} \cos \left(\frac{2\pi}{10} x \right)$
- D. $y = \frac{3}{2} \cos \left(\frac{2\pi}{5} x \right)$

- 20. FERRIS WHEELS** A Ferris wheel at a state fair has a diameter of 65 feet and makes 4 complete revolutions each minute. Santiago boards a car of the Ferris wheel at the car's lowest point, and he rides for 2 minutes. Write and graph a trigonometric function that models his height above or below the axle of the Ferris wheel θ minutes after the ride starts.



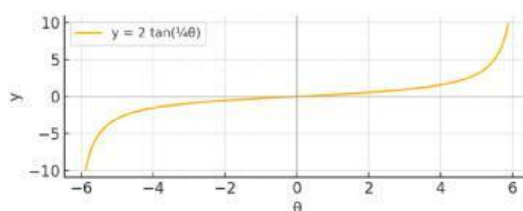
- A) $y = 3.25 \sin 8\pi \theta$
- B) $y = 3.25 \sin 8 \theta$
- C) $y = 3.25 \cos 8\pi \theta$
- D) $y = 3.25 \cos 8 \theta$

Abdulkader Amro (0566028336)

18.

What is the period of the function $y = 2 \tan\left(\frac{1}{4}\theta\right)$?

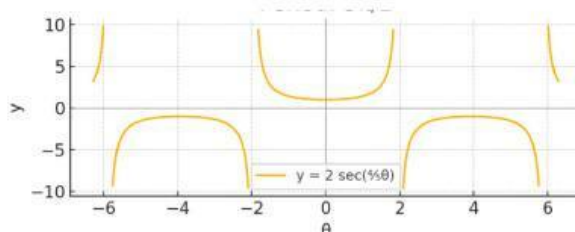
- A. π
B. 2π
C. 4π
D. $\frac{\pi}{4}$



19.

What is the period of the function $y = 2 \sec\left(\frac{4}{5}\theta\right)$?

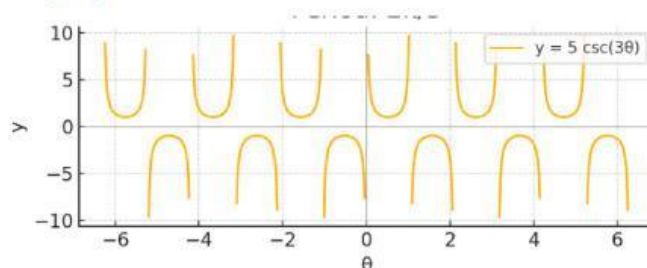
- A. 2π
B. $\frac{5\pi}{2}$
C. $\frac{5\pi}{4}$
D. $\frac{5\pi}{3}$



20.

What is the period of the function $y = 5 \csc(3\theta)$?

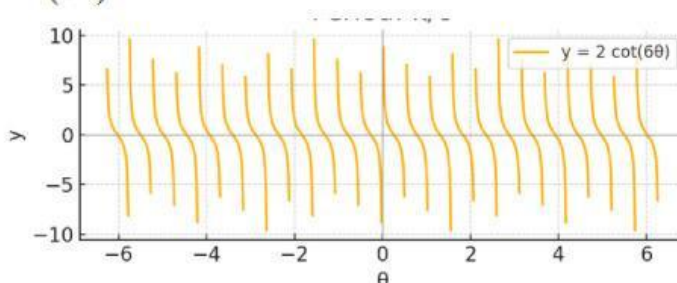
- A. $\frac{\pi}{3}$
B. $\frac{2\pi}{3}$
C. $\frac{2\pi}{5}$
D. $\frac{2\pi}{3}$



21.

What is the period of the function $y = 2 \cot(6\theta)$?

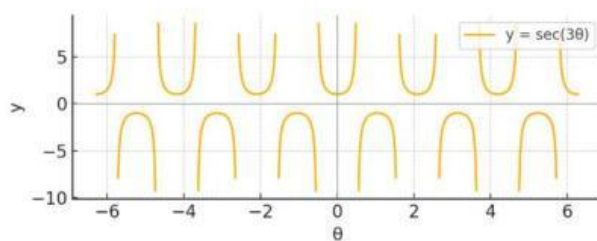
- A. $\frac{\pi}{6}$
B. $\frac{2\pi}{6}$
C. $\frac{\pi}{3}$
D. 6π



22.

What is the period of the function $y = \sec(3\theta)$?

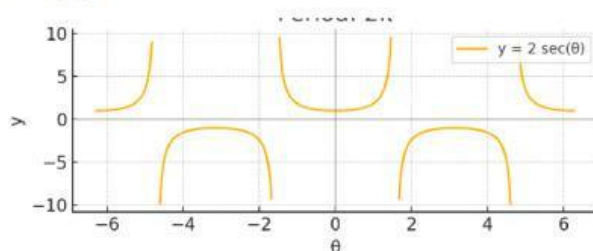
- A. $\frac{2\pi}{3}$
 B. π
 C. $\frac{\pi}{3}$
 D. 3π



23.

What is the period of the function $y = 2 \sec(\theta)$?

- A. π
 B. 2π
 C. θ
 D. 4π



14

Find values of inverse trigonometric functions.

Exercises (1-9)

P475

1. $\cos^{-1}\left(\frac{\sqrt{3}}{2}\right)$

What is the angle whose cosine is $\frac{\sqrt{3}}{2}$?

- A) 60° or $\frac{\pi}{3}$
 B) 30° or $\frac{\pi}{6}$
 C) 45° or $\frac{\pi}{4}$
 D) 120° or $\frac{2\pi}{3}$

2. $\sin^{-1}\left(-\frac{\sqrt{3}}{2}\right)$

What is the angle whose sine is $-\frac{\sqrt{3}}{2}$?

- A) -60° or $-\frac{\pi}{3}$
 B) -30° or $-\frac{\pi}{6}$
 C) -45° or $-\frac{\pi}{4}$
 D) 60° or $\frac{\pi}{3}$

3. $\cos^{-1}\left(-\frac{1}{2}\right)$

- A) 60° or $\frac{\pi}{3}$
 B) 120° or $\frac{2\pi}{3}$
 C) 150° or $\frac{5\pi}{6}$
 D) 135° or $\frac{3\pi}{4}$

4. $\tan^{-1}(\sqrt{3})$

- A) 30° or $\frac{\pi}{6}$
 B) 45° or $\frac{\pi}{4}$
 C) 60° or $\frac{\pi}{3}$
 D) 90° or $\frac{\pi}{2}$

5. $\cos^{-1}\left(-\frac{\sqrt{2}}{2}\right)$ A) 135° or $\frac{3\pi}{4}$ B) 45° or $\frac{\pi}{4}$ C) 120° or $\frac{2\pi}{3}$ D) 150° or $\frac{5\pi}{6}$	6. $\tan^{-1}(-1)$ A) -45° or $-\frac{\pi}{4}$ B) -30° or $-\frac{\pi}{6}$ C) -60° or $-\frac{\pi}{3}$ D) -90° or $-\frac{\pi}{2}$
7. $\sin^{-1}\left(-\frac{\sqrt{2}}{2}\right)$ A) -45° or $-\frac{\pi}{4}$ B) -30° or $-\frac{\pi}{6}$ C) -60° or $-\frac{\pi}{3}$ D) 45° or $\frac{\pi}{4}$	8. $\cos^{-1}\left(-\frac{\sqrt{3}}{2}\right)$ A) 30° or $\frac{\pi}{6}$ B) 150° or $\frac{5\pi}{6}$ C) 120° or $\frac{2\pi}{3}$ D) 135° or $\frac{3\pi}{4}$
9. $\sin^{-1}(1)$ A) 90° or $\frac{\pi}{2}$ B) 0° or 0 C) 180° or π D) 45° or $\frac{\pi}{4}$	

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Find values of inverse trigonometric functions.

Exercises (19-30)

P475

19. $\sin \theta = 0.8$ A) 53.13° B) 36.87° C) 45.57° D) 143.13°	20. $\tan \theta = 4.5$ A) 77.47° B) 66.04° C) 81.87° D) 65.38°
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21. $\cos \theta = 0.5$ A) 45° B) 30° C) 60° D) 90°	22. $\cos \theta = -0.95$ A) 161.87° B) 161.79° C) 168.20° D) 161.54°
23. $\sin \theta = -0.1$ A) -5.74° B) -10.00° C) -3.27° D) -9.21°	24. $\tan \theta = -1$ A) -30.00° B) -60.00° C) -45.00° D) -90.00°
25. $\cos \theta = 0.52$ A) 58.68° B) 61.10° C) 45.20° D) 57.73°	26. $\cos \theta = -0.2$ A) 101.54° B) 110.48° C) 101.79° D) 102.25°
27. $\sin \theta = 0.35$ A) 19.47° B) 20.51° C) 24.58° D) 29.11°	28. $\tan \theta = 8$ A) 82.87° B) 82.13° C) 81.78° D) 83.02°
29. $\cos \theta = 0.25$ A) 75.52° B) 70.53° C) 63.37° D) 75.52°	30. $\sin \theta = -0.57$ A) -34.75° B) -36.00° C) -33.67° D) -37.18°