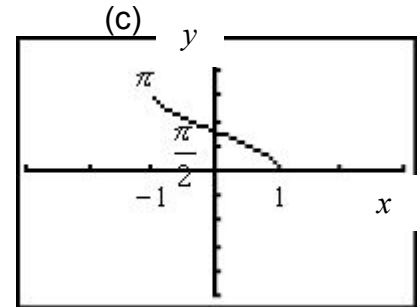
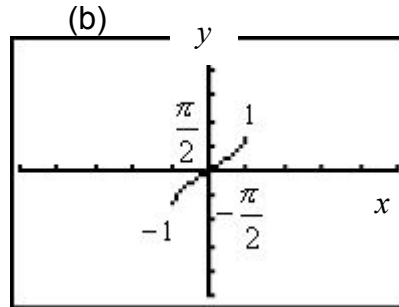
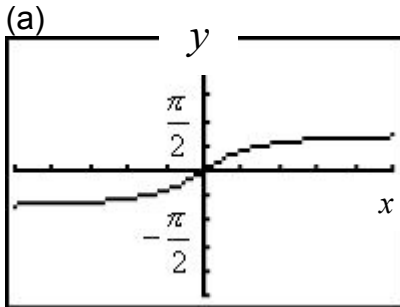


Practice Problems for Exam 3 Chapter 5 & 6

1. Each of the following graphs is the graph of an inverse trig function. Write an appropriate inverse trig function for each graph.



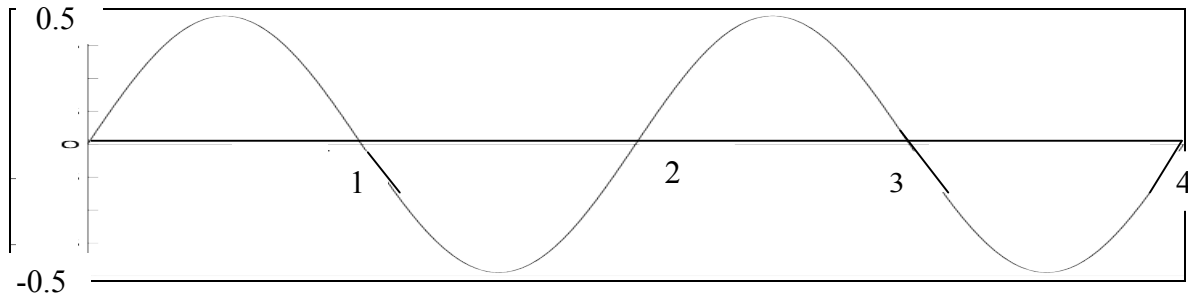
2. Find angles that are coterminal with 230° .
3. Find one angle that is coterminal with -83° and a reference angle of -83°
4. Convert 1.62° to radian measure.
5. What is the reference angle of 173° ?
6. Find the exact value of $\tan\left(-\frac{26\pi}{12}\right)$.
7. If an angle θ is in standard position and the terminal side of θ intersects the unit circle at the point $\left(-\frac{1}{\sqrt{3}}, -\frac{2}{\sqrt{3}}\right)$, find the **exact value** of $\tan\theta$ and $\csc\theta$.
8. If $\sin x = \frac{\sqrt{3}}{2}$ and $\cos x < 0$, find the exact value of $\tan(x)$.
9. If $\sec\theta = 5$ and $\tan\theta = 2\sqrt{6}$, find the exact value of $\sin\theta$.
10. Write the letter corresponding to the correct answer.

$$\frac{\csc(-x) - \sin(-x)}{\cos(-x)} =$$

(a) $-\sin x$ (b) $\cos x$ (c) $\tan x$ (d) $-\tan x$ (e) $\cot x$ (f) $-\cot x$ (g) $-\sec x$ (h) $\csc x$
11. Find the amplitude, period, phase shift, and vertical shift of each of the following functions. Also graph the function over an interval of at least one period of length.

(a) $y = -\sin(2\pi x - \pi)$ (b) $y = -\csc(2\pi x - \pi)$ (c) $y = -\tan(2\pi x - \pi)$

12. Write an equation of the form $y = a \cdot \sin[k(x-b)] + c$ and $y = a \cdot \cos[k(x-b)] + c$ whose graph is the given sine wave.



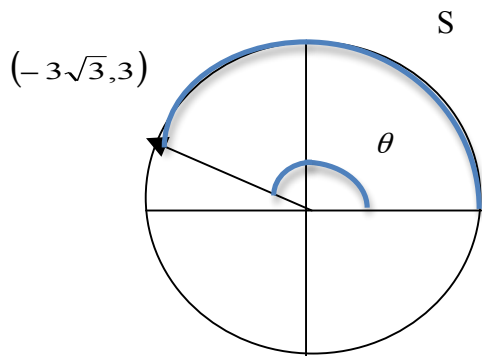
13. Find the exact value of each of the expressions.

(a) $\cot(\sin^{-1}(0))$

(b) $\csc\left(\cos^{-1}\left(-\frac{1}{3}\right)\right)$

(c) $\sin\left(\cos^{-1}\left(-\frac{3}{4}\right)\right)$

14. The terminal side of θ goes through $(-3\sqrt{3}, 3)$ as shown below.



(a) Find the exact value of $\sin \theta$.

(b) Find the radius of the circle.

(c) Find the angle θ .

(d) Find the exact length of the arc S .

(e) Find the area of the sector.

15. Simplify each expression and write your answer as a single trig function.

(a) $\frac{\csc(-x) - \sin(-x)}{\cos(-x)} =$

(b) $\tan x(\csc x \cos x - \sin x \cos x) =$

16. A police helicopter chasing a stolen car. The altitude of the helicopter from the ground is 1000ft. The sighted angle of depression is 60 degrees. How far is the helicopter from the car? Find the distance from the stolen car to a point directly below the helicopter.

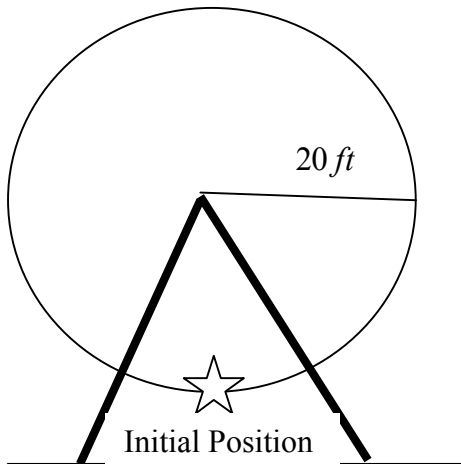
17. A circle has a diameter of 12 feet.

(a) Find the **exact length** of an arc subtended by an angle of 40° .

(b) Find the **exact area** of a sector of a circle having diameter 12 ft and central angle 40° .

18. A bicycle wheel with a radius of 18 inches turns with an angular velocity of 4 radians per second. Find the distance traveled by a point on the bicycle tire 40 seconds. Write your answer as an **exact value**.

19. A phonograph record is turning at 40 revolutions per minute. If the distance from the center of the record to a point on the edge of the record is 6 inches, find the angular velocity and the linear velocity of the point in feet per minute. Write your answer as an **exact value**.
20. Suppose that the ferris wheel pictured below rotates in a counterclockwise manner at 1 revolution per 80 seconds. Suppose that the radius of the wheel is 20 ft and the bottom of the wheel passes 2 ft above the ground.



- (a) Find the angular and linear speed of the ferris wheel.
- (b) What is the area of the sector made by rotating the ferris wheel from the initial position in 30 second
- (c) What is the length of the arc made by rotating the ferris wheel from the initial position in 30 second?

21. A surveyor determines that the angle of elevation of the top of a tower from a point on the ground is 29° . He then moves back 210 ft and determines that the angle of elevation is 25° . What is the height of the tower?
22. A ship leaves port and heads in the direction $S 35^\circ W$. After traveling 8 miles, the ship makes a course correction and heads in the direction $N 55^\circ W$ for 20 miles.
- (a) At that time, what is the **exact distance** between the ship and the port?
- (b) At that time, what is the bearing of the ship from port?
23. A ship leaves port and heads in the direction $S 40^\circ W$. After traveling 8 miles, the ship makes a course correction and heads in the direction $N 40^\circ W$ for 10 miles. At that time, what is the **exact distance** between the ship and the port?

24. Find three angles for the given triangle.

