Precalculus – Math 1113

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Test 2 Review Video

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

$23^\circ 47'37''$

- ○ 23.94°
- ○ 23.79°
- ○ 23.84°
- ○ 23.52°

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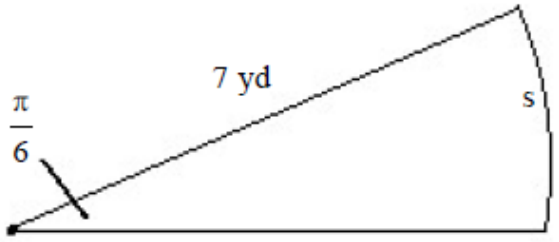
2. Find the length s. Round to three decimal places.



- **A.** 13.367 yd
- **B.** 7.332 yd
- **C.** 3.666 yd
- **D.** 2.693 yd

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

r = 18 feet, A = 95 square feet, θ = ?

- **A.** 0.59 radians
- **B.** 0.29 radians
- **C.** 15,390.00 radians
- **D.** 30,780.00 radians

4. Convert the angle in degrees to radians. Express the answer as multiple of π.

-105°

- $-\frac{6\pi}{11}$
- $-\frac{12\pi}{7}$
- $-\frac{7\pi}{12}$
- $-\frac{8\pi}{13}$

5. Convert the angle in radians to degrees.

$$-\frac{8}{3}\pi$$

- ○ -240°
- ○ $-960\pi^\circ$
- ○ -8°
- ○ -480°

6. An irrigation sprinkler in a field of lettuce sprays water over a distance of 40 feet as it rotates through an angle of 160°. What area of the field receives water? Round to two decimal places.

- $4{,}468.62\ ft^2$
- $2{,}234.02\ ft^2$
- $55.86\ ft^2$
- $142.22\ ft^2$

7. Two sides of a right triangle ABC (C is the right angle) are given. Find the indicated trigonometric function of the given angle. Give exact answers with rational denominators.

Find **sin** B when b = 9 and c = 10.

- $\frac{9\sqrt{19}}{19}$
- $\frac{9}{10}$
- $\frac{10\sqrt{19}}{19}$
- $\frac{\sqrt{19}}{10}$

8. Two sides of a right triangle ABC (C is the right angle) are given. Find the indicated trigonometric function of the given angle. Give exact answers with rational denominators.

Find **cot** A when b = 5 and c = 6.

- $\frac{5\sqrt{11}}{11}$
- $\frac{\sqrt{11}}{5}$
- $\frac{\sqrt{11}}{6}$
- $\frac{6\sqrt{11}}{11}$

9. The point P, $\left(\frac{2}{9}, \frac{\sqrt{77}}{9}\right)$, on the unit circle that corresponds to a real number t is given. Find the indicated trigonometric function.

Find **tan** t.

- $\frac{9}{2}$
- $\frac{\sqrt{77}}{9}$
- $\frac{\sqrt{77}}{2}$
- $\frac{2\sqrt{77}}{77}$

10. The point P, $\left(-\frac{\sqrt{7}}{4}, -\frac{3}{4}\right)$, on the unit circle that corresponds to a real number t is given. Find the indicated trigonometric function.

Find **sin** t.

- $-\frac{\sqrt{7}}{4}$
- $-\frac{3}{4}$
- $\frac{4}{3}$
- $-\frac{4\sqrt{7}}{7}$

11. The point P, $\left(-\frac{\sqrt{11}}{6}, -\frac{5}{6}\right)$, on the unit circle that corresponds to a real number t is given. Find the indicated trigonometric function.

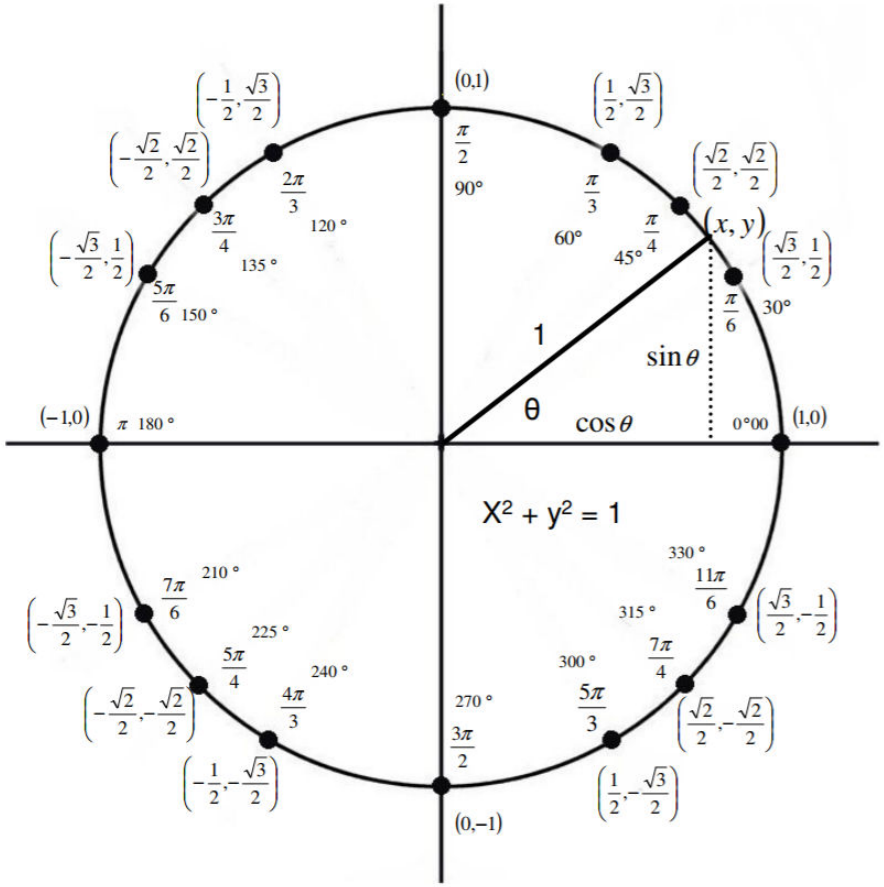
Find **cot** t.

- $-\frac{5\sqrt{11}}{11}$
- $\frac{\sqrt{11}}{6}$
- $\frac{\sqrt{11}}{5}$
- $-\frac{\sqrt{11}}{5}$

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

tan 930°

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



13. The point P, $(-12,5)$, on the circle $x^2 + y^2 = r^2$ that is also on the terminal side of an angle θ in standard position is given. Find the indicated trigonometric function.

Find **cos** θ.

- $\frac{5}{13}$
- $-\frac{5}{13}$
- $\frac{12}{13}$
- $-\frac{12}{13}$

14. If $f(x) = \sin x$ and $f(a) = -\frac{1}{9}$, find the exact value of $f(a) + f(a - 4\pi) + f(a - 2\pi)$.

- $-\frac{1}{3}$
- $-\frac{1}{6}$
- $\frac{1}{3}$
- $\frac{1}{6}$

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

$\sin 21^\circ$

- 0.22
- 0.7
- 0.36
- 0.84

16. Use a calculator to find the approximate value of the expression. Round to two decimal places as needed.

$\sec \frac{\pi}{5}$

- 1
- 1.18
- 0.94
- 1.24

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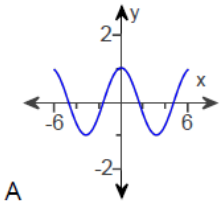
17. Without graphing the function, determine its amplitude or period as requested.

Find the period of the function $y = \cos 5x$.

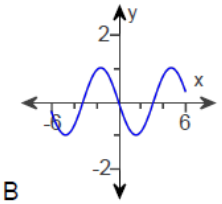
- $\frac{2\pi}{5}$
- 2π
- 5
- 1

18. Match the given function to its graph.

1) $y = \sin x$ 2) $y = \cos x$ 3) $y = -\sin x$ 4) $y = -\cos x$



A



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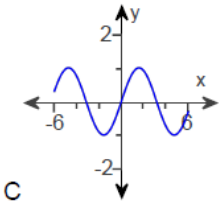
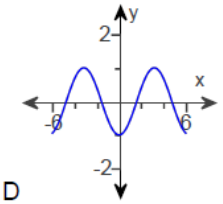


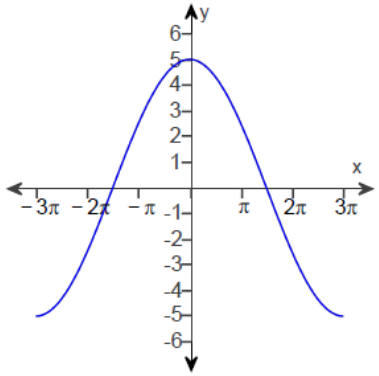
C



D

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

19. Find an equation for the graph.

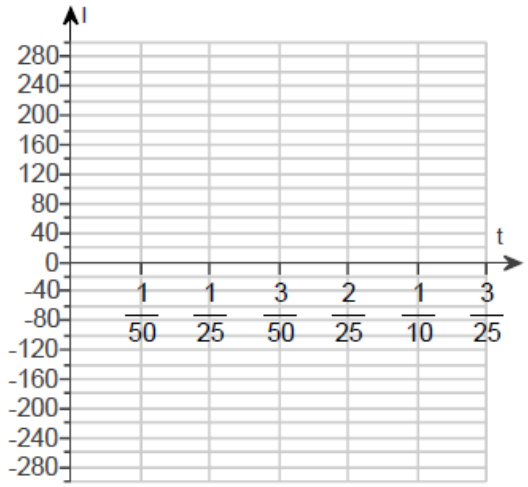


- A. $y = 5\cos\left(\frac{1}{3}x\right)$
- B. $y = 3\cos\left(\frac{1}{5}x\right)$
- C. $y = 5\cos(3x)$
- D. $y = 3\cos(5x)$

20. The current I, in amperes, flowing through an ac (alternating current) circuit at time t, in seconds, is shown below.

$I(t) = 160 \sin(50\pi t) \quad t \geq 0$

What is the period? What is the amplitude? Graph this function over two periods.



What is the period?

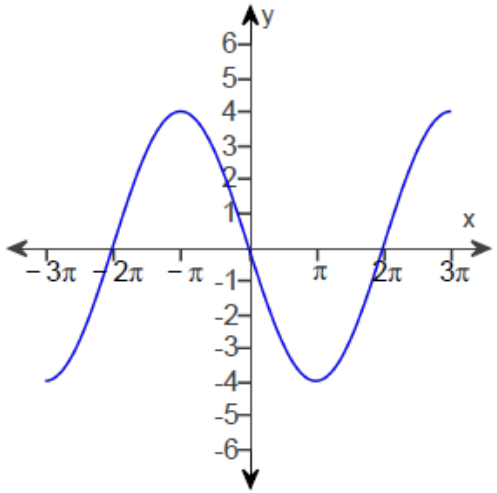
T = _____ (Simplify your answer.)

What is the amplitude?

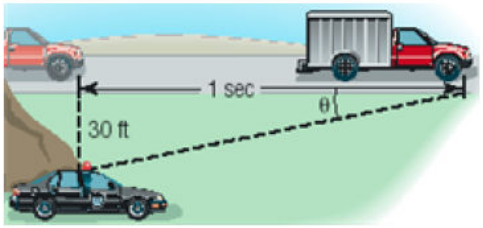
|A| = _____ (Simplify your answer.)

Use the graphing tool to graph the function.

21. Bonus 1 Find an equation for the graph.



- A. $y = -4\cos\left(\frac{1}{2}x\right)$
- B. $y = -4\sin\left(\frac{1}{2}x\right)$
- C. $y = -4\cos(2x)$
- D. $y = -4\sin(2x)$

22. 

A state trooper is hidden 30 feet from a highway. One second after a truck passes, the angle θ between the highway and the line of observation from the patrol car to the truck is measured. See the illustration.

(a) If the angle measures 17°, how fast is the truck traveling? Express the answer in feet per second and in miles per hour.

What is the speed of the truck in feet per second?

_____ feet per second
(Do not round until the final answer. Then round to two decimal places as needed.)

What is the speed of the truck in miles per hour?

_____ miles per hour
(Use the answer from part (a) to find this answer. Round to one decimal place as needed.)

(b) If the angle measures 27°, how fast is the truck traveling? Express the answer in feet per second and in miles per hour.

What is the speed of the truck in feet per second?

_____ feet per second
(Do not round until the final answer. Then round to two decimal places as needed.)

What is the speed of the truck in miles per hour?

_____ miles per hour.
(Use the answer from part (b) to find this answer. Round to one decimal place as needed.)

(c) If the speed limit is 55 miles per hour and a speeding ticket is issued for speeds of 5 miles per hour or more over the limit, for what angles should the trooper issue a ticket?

The trooper should issue a ticket when the angle is equal to or less than _____ $^\circ$.
(Round to the nearest tenth as needed.)

23. A radio transmission tower is 210 feet tall. How long should a guy wire be if it is to be attached 9 feet from the top and is to make an angle of 30° with the ground? Give your answer to the nearest tenth of a foot.

- **A.** 242.5 ft
- **B.** 402.0 ft
- **C.** 420.0 ft
- **D.** 232.1 ft

1. 23.79°

2. C. 3.666 yd

3. A. 0.59 radians

4. $-\frac{7\pi}{12}$

5. -480°

6. 2,234.02 ft^2

7. $\frac{9}{10}$

8. $\frac{5\sqrt{11}}{11}$

9. $\frac{\sqrt{77}}{2}$

10. $-\frac{3}{4}$

11. $\frac{\sqrt{11}}{5}$

12. $\frac{\sqrt{3}}{3}$

13. $-\frac{12}{13}$

14. $-\frac{1}{3}$

15. 0.36

16. 1.24

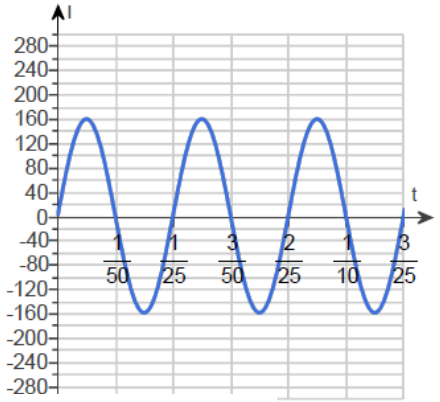
17. $\frac{2\pi}{5}$

18. A. 1C, 2A, 3B, 4D

19. A. $y = 5\cos\left(\frac{1}{3}x\right)$

20. $\frac{1}{25}$

160



21. B. $y = -4\sin\left(\frac{1}{2}x\right)$

22. 98.13

66.9

58.88

40.1

18.8

23. B. 402.0 ft