

Precalculus Honors

Trigonometric Functions

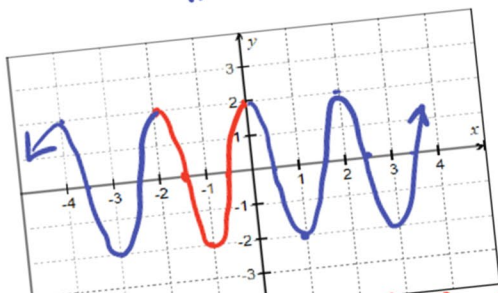


$$= 2 \cos(\pi x + 2\pi)$$

Amplitude: 2

Period: $\frac{2\pi}{\pi} = 2$

Phase shift: $-\frac{2\pi}{\pi} = -2$ left

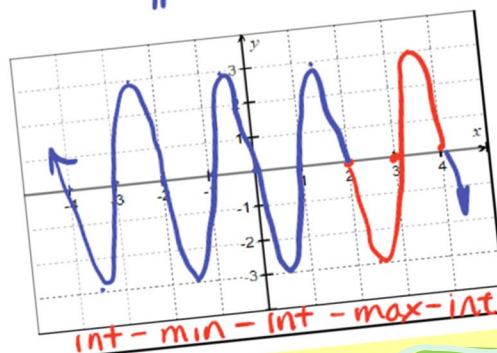


8. $y = -3 \sin(\pi x - 4\pi)$

Amplitude: 3

Period: $\frac{2\pi}{\pi} = 2$

Phase shift: $\frac{4\pi}{\pi} = 4$ right



Homework

4

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Scope and Sequence

Unit 4: Trigonometric Functions

Lesson	Skills & Learning Objectives
[4.1] Angles and Their Measure	☐ Convert from decimal degree to DMS ☐ Find reference angles and coterminal angles ☐ Convert between degrees and radians ☐ Naming and drawing angles in standard position
[4.2] Right Triangle Trigonometry	☐ Evaluate trigonometric functions of special triangles ☐ Use technology to find approximate values of trigonometric functions ☐ Solve real-world problems using right triangles
[4.3] Arc Length and Circular Motion	☐ Find arc length and area of a sector ☐ Linear speed and angular speed
[4.4] The Unit Circle	☐ Use the 16-point unit circle ☐ Define trigonometric functions using right triangles ☐ Find exact values using the unit circle
[4.5] Properties of Trigonometric Functions	☐ Find domain and range of trigonometric functions ☐ Determine signs and values given an angle or a quadrant ☐ Use even and odd properties ☐ Use fundamental identities
[4.6] Graphs of Sine and Cosine	☐ Find period, amplitude, midline of sine and cosine curves ☐ Graph transformations.

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Scope and Sequence

Unit 4: Trigonometric Functions

Lesson	Skills & Learning Objectives
[4.7] Graphs of Other Trig Functions	☐ Graph tangent, cotangent, secant, and cosecant functions ☐ Graph transformations
[4.8] Inverse Trigonometric Functions	☐ Relate inverse properties to trigonometric functions
[4.9] More Inverse Trig Functions	☐ Relate inverse properties for cosecant, secant and cotangent to trigonometric functions
[4.10] Sinusoidal Curve Fitting	☐ Solve real-world problems related to periodic behavior ☐ Use curve fitting techniques to sketch sinusoidal functions
[4.11] Solving Problems with Trigonometry	☐ Solve more right triangle problems including navigation and simple harmonic motion

4.2

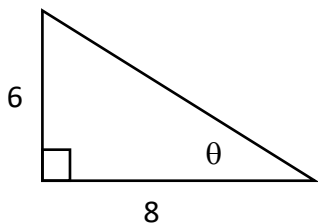
Right Triangle Trigonometry Homework

Name _____

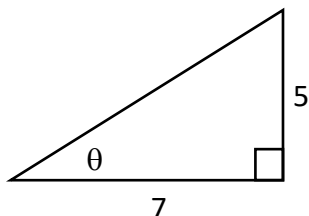
Date _____ Period _____

Problems 1 – 4, Find the values of $\sin \theta$, $\cos \theta$, and $\tan \theta$ of the angle.

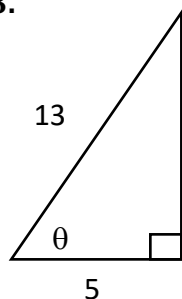
1.



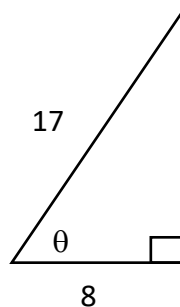
2.



3.



4.



Problems 5– 8, Assume that θ is an acute angle in a right triangle satisfying the given conditions. Evaluate the remaining trigonometric functions.

5. $\sin \theta = \frac{5}{11}$

6. $\tan \theta = \frac{5}{12}$

7. $\cos \theta = \frac{5}{8}$

8. $\sec \theta = \frac{17}{15}$

4.3

Arc Length and Circular Motion Homework

Name _____

Date _____ Period _____

Problems 1 – 4, Use the arc length formula $s = r\theta$ to find the missing quantity. Round answers to three decimal places.

1. $r = 5$ miles, $s = 3$ miles, $\theta = ?$

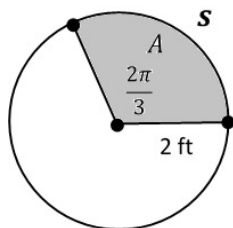
2. $s = 6$ feet $\theta = \frac{1}{2}$ radian, $r = ?$

3. $r = 3$ inches, $\theta = 120^\circ$ $s = ?$

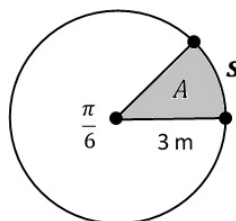
4. $s = 2$ m, $\theta = \frac{1}{3}$ radian, $r = ?$

Problems 5 – 6, Find the length s and area A . Round answers to three decimal places.

5.



6.



4.6

Graphs of Sine and Cosine Homework

Name _____

Date _____ Period _____

Problems 1 – 4, Determine the amplitude and period of each function without graphing.

1. $y = 5 \sin(\pi x)$

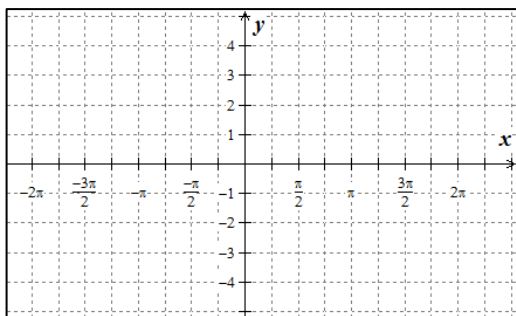
2. $y = -4 \cos\left(\frac{3}{2}x\right)$

3. $y = 2 \sin(3x - \pi) + 4$

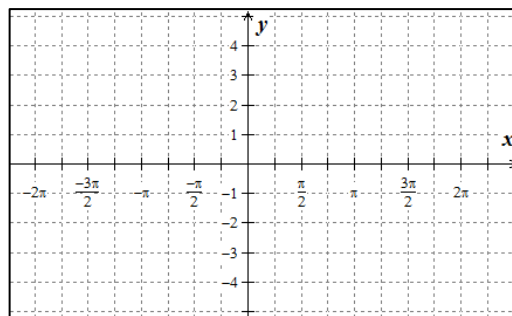
4. $y = 7 \cos(4x + \pi) - 3$

Problems 5 – 8, Use transformations to graph each equation from $(-2\pi, 2\pi)$

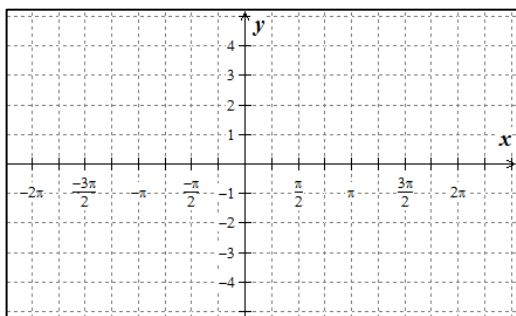
5. $y = 2 \sin x$



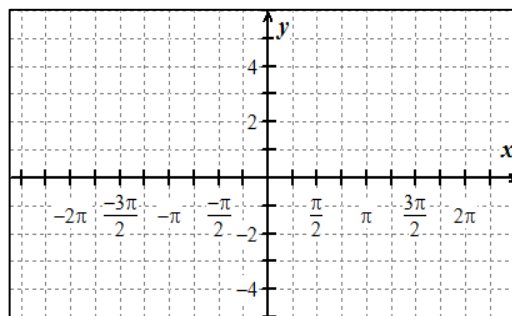
6. $y = -\sin\left(\frac{1}{2}x\right)$



7. $y = 2 \cos(x) - 1$



8. $y = -3 \sin(x) + 2$



Problems 19 – 24, True or False. Do not use a calculator. Give a reason for your answer.

19. $\sin^{-1} \left[\sin \left(-\frac{\pi}{10} \right) \right] = -\frac{\pi}{10}$

20. $\cos[\cos^{-1}(2)] = 2$

21. $\cos^{-1} \left[\cos \left(-\frac{\pi}{4} \right) \right] = -\frac{\pi}{4}$

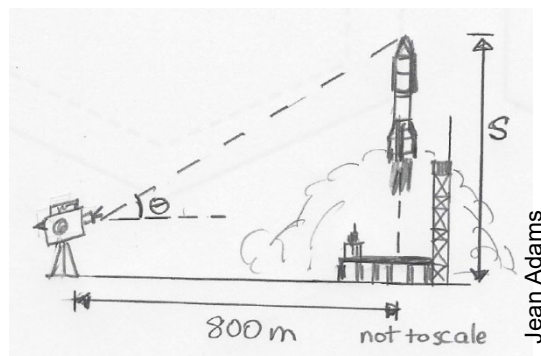
22. $\tan^{-1} \left[\tan \left(-\frac{\pi}{3} \right) \right] = -\frac{\pi}{3}$

23. $\sin^{-1} \left[\sin \left(\frac{2\pi}{3} \right) \right] = \frac{2\pi}{3}$

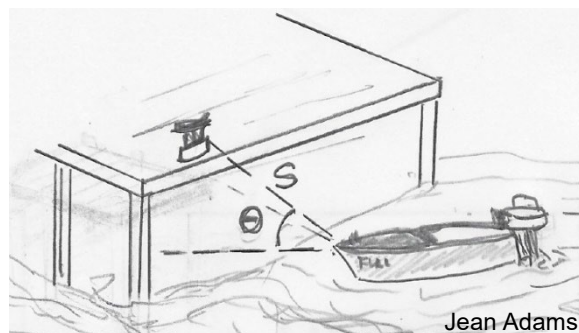
24. $\tan \left[\tan^{-1} \left(-\frac{1}{2} \right) \right] = -\frac{1}{2}$

Problems 25-26, Solve.

25. A remote camera at ground level is filming the lift-off of an Atlas rocket at a point 800 meters from the launch pad. Let θ be the angle of elevation to the rocket and let s be the height of the rocket. Find θ when $s = 1500$ meters.

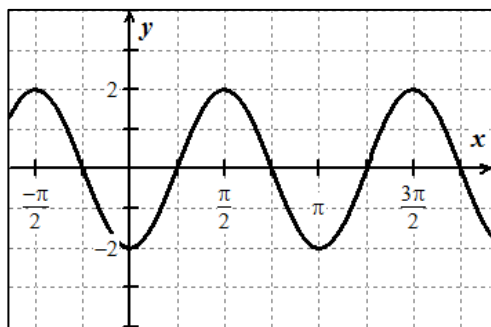


26. A motorboat is being pulled into a seawall dock by an electric pulley at a dock that is 8 feet above the deck of the boat. Let θ be the angle of elevation from the boat to the pulley and let s be the length of the rope from the pulley to the boat. Find θ when $s = 30$ feet.

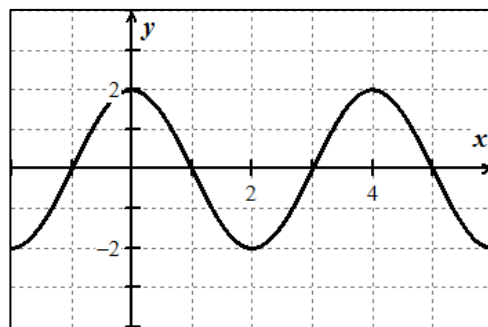


Problems 13-16, Match the given function to one of the graphs [A] – [D].

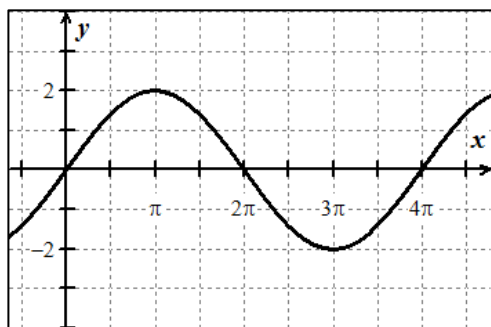
[A]



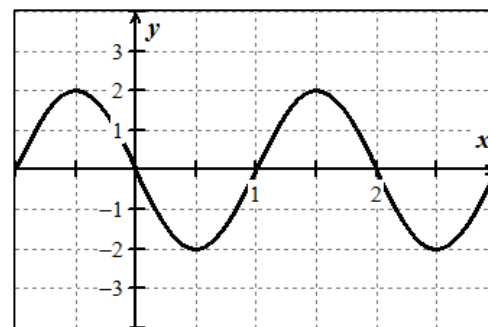
[B]



[C]



[D]



13. $y = 2 \cos\left(\frac{\pi}{2}x\right)$

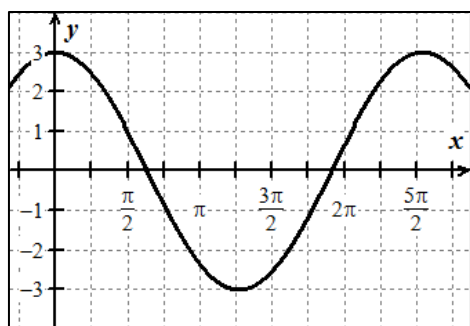
14. $y = -2 \sin(\pi x)$

15. $y = -2 \cos(2x)$

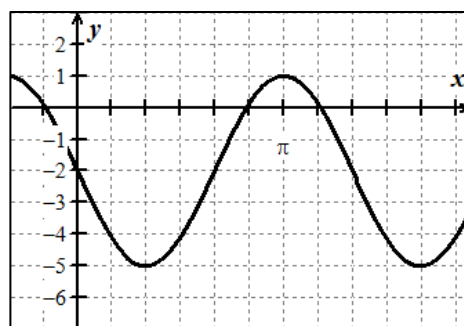
16. $y = 2 \sin\left(\frac{1}{2}x\right)$

Problems 17-18, Find an equation for each graph.

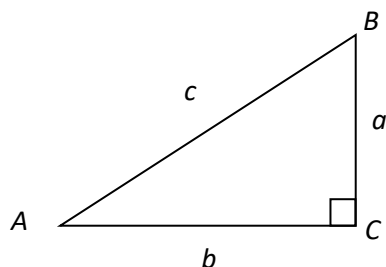
17.



18.



Problems 1 – 2, Use the right triangle shown below, to solve each triangle.



1. $a = 6, B = 40^\circ$, Find b, c , and A

2. $b = 4, c = 6$, Find a, A , and B

Problems 3 – 6, Solve.

3. A right triangle has a hypotenuse of length 9 inches. If one angle is 35° , find the length of each leg.

4. The hypotenuse of a right triangle is 13 inches. If one leg is 5 inches, find the degree measure of each angle.

5. A right triangle contains a 52° angle. If one leg is of length 6 inches, what is the length of the hypotenuse. [two possible answers.]

6. A right triangle contains an angle of $3\pi/8$ radian. If one leg has a length of 4 meters, what is the length of the hypotenuse? [two possible answers.]