

Homework 10.1 Unit Circle

ANSWERS

Algebra 2A

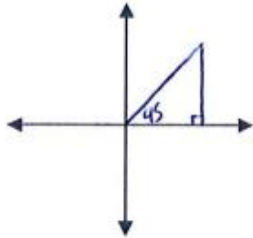
Name Key

10.1

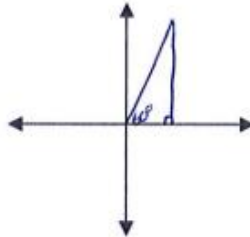
Assignment

Find the exact value of each function. Draw the picture!

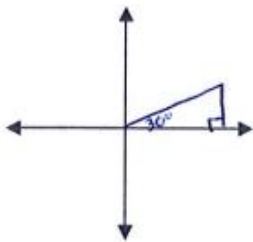
1. $\cos 45^\circ = \frac{\sqrt{2}}{2}$



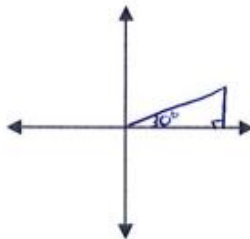
2. $\sin 60^\circ = \frac{\sqrt{3}}{2}$



3. $\cos 30^\circ = \frac{\sqrt{3}}{2}$

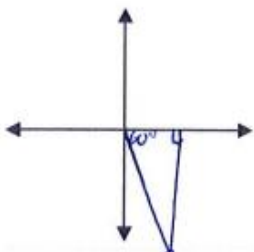


4. $\sin 30^\circ = \frac{1}{2}$



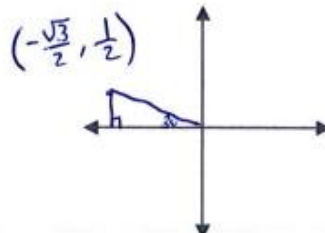
Find the given point $P(x, y) = P(\cos \theta, \sin \theta)$ given the quadrant. Draw the right triangle in the given quadrant with one leg on the x-axis.

5. 60° in quadrant IV

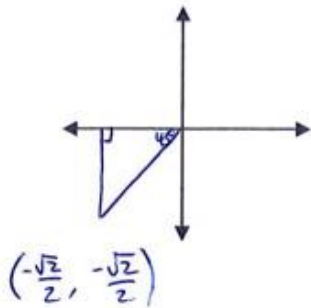


$(\frac{1}{2}, -\frac{\sqrt{3}}{2})$

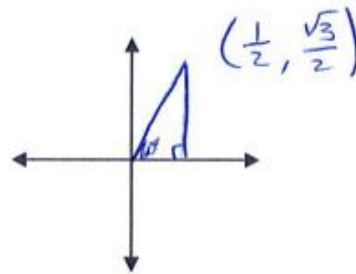
6. 30° in quadrant II



7. 45° in quadrant III



8. 60° in quadrant I



If θ is an angle in standard position and if the given point P is located on the terminal side of θ and on the unit circle, find $\sin\theta$ and $\cos\theta$. Remember: $P(x, y) = P(\cos\theta, \sin\theta)$ where $\cos\theta = x$ and $\sin\theta = y$.

9. $P\left(-\frac{3}{7}, \frac{5}{7}\right)$

$$\sin\theta = \frac{5}{7}$$

$$\cos\theta = \frac{-3}{7}$$

10. $P\left(-\frac{\sqrt{3}}{2}, \frac{-1}{2}\right)$

$$\sin\theta = \frac{-1}{2}$$

$$\cos\theta = \frac{-\sqrt{3}}{2}$$

11. $P\left(\frac{\sqrt{2}}{2}, -\frac{\sqrt{2}}{2}\right)$

$$\sin\theta = \frac{-\sqrt{2}}{2}$$

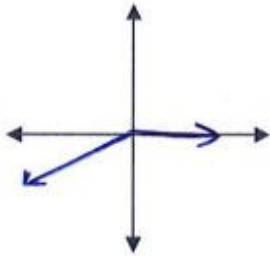
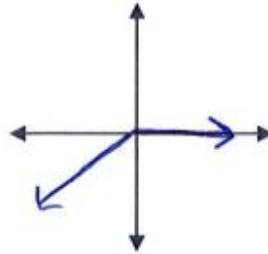
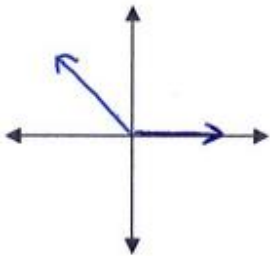
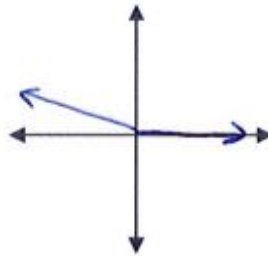
$$\cos\theta = \frac{\sqrt{2}}{2}$$

12. $P\left(-\frac{15}{17}, \frac{8}{17}\right)$

$$\sin\theta = \frac{8}{17}$$

$$\cos\theta = \frac{-15}{17}$$

Draw an angle with the given measure in standard position.

1. 210° 2. 580° 3. 135° 4. -560° 

Rewrite each degree measure in radians and each radian measure in degrees.

5. 18° $\frac{\pi}{10}$

6. 870° $\frac{29\pi}{6}$

7. -72° $-\frac{2\pi}{5}$

8. -250° $-\frac{25\pi}{18}$

9. 4π 720°

10. $\frac{13\pi}{5}$ 468°

11. $-\frac{9\pi}{2}$ -810°

12. $-\frac{3\pi}{8}$ -67.5°

Find one angle with positive measure and one angle with negative measure coterminal with each angle.

13. 65°
 425°
 -295°

14. 285°
 645°
 -75°

15. 110°
 470°
 -250°

16. -93°
 267°
 -453°

17. $\frac{2\pi}{5}$
 $\frac{12\pi}{5}$
 $-\frac{8\pi}{5}$

18. $\frac{17\pi}{6}$
 $\frac{29\pi}{6}$
 $-\frac{7\pi}{6}$

19. $-\frac{3\pi}{2}$
 $\frac{\pi}{2}$
 $-\frac{7\pi}{2}$

20. $-\frac{5\pi}{12}$
 $\frac{19\pi}{12}$
 $-\frac{29\pi}{12}$


Algebra 2A

Name Key

10.3

Assignment

Find the exact values of the six trigonometric functions of θ if the terminal side of θ in standard position contains the given point.

1. (6, 8) 

$\sin \theta = \frac{4}{5}$


$\cos \theta = \frac{3}{5}$

$\tan \theta = \frac{4}{3}$

$\csc \theta = \frac{5}{4}$

$\sec \theta = \frac{5}{3}$

$\cot \theta = \frac{3}{4}$

2. (-20, 21) 

$\sin \theta = \frac{21}{29}$

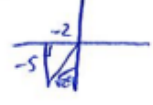
$\cos \theta = -\frac{20}{29}$

$\tan \theta = -\frac{21}{20}$

$\csc \theta = \frac{29}{21}$

$\sec \theta = -\frac{29}{20}$

$\cot \theta = -\frac{20}{21}$

3. (-2, -5) 

$\sin \theta = -\frac{5\sqrt{29}}{29}$

$\cos \theta = -\frac{2\sqrt{29}}{29}$

$\tan \theta = \frac{5}{2}$

$\csc \theta = -\frac{\sqrt{29}}{5}$

$\sec \theta = -\frac{\sqrt{29}}{2}$

$\cot \theta = \frac{2}{5}$

Find the reference angle for the angle with the given measure.

4. 236°

56°

5. $\frac{13\pi}{8}$

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

6. -210°

30°

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

$\frac{\pi}{4}$

USE THE UNIT CIRCLE!

Find the exact value of each trigonometric function.

8. $\tan 135^\circ$

-1

9. $\cot 210^\circ$

$\sqrt{3}$

10. $\cot(-90^\circ)$

0°

11. $\tan \frac{5\pi}{3}$

$-\sqrt{3}$

12. $\csc\left(-\frac{3\pi}{4}\right)$

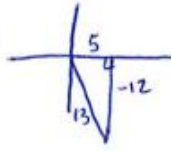
$-\sqrt{2}$

13. $\cot 2\pi$

undefined

Suppose θ is an angle in standard position whose terminal side is in the given quadrant. For each function, find the exact values of the remaining five trigonometric functions of θ .

14. $\tan \theta = -\frac{12}{5}$, Quadrant IV



$$\sin \theta = -\frac{12}{13}$$

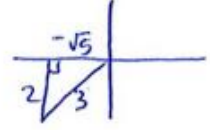
$$\cos \theta = \frac{5}{13}$$

$$\csc \theta = -\frac{13}{12}$$

$$\sec \theta = \frac{13}{5}$$

$$\cot \theta = -\frac{5}{12}$$

14. $\sin \theta = \frac{2}{3}$, Quadrant III



$$\cos \theta = -\frac{\sqrt{5}}{3}$$

$$\tan \theta = -\frac{2\sqrt{5}}{5}$$

$$\csc \theta = \frac{3}{2}$$

$$\sec \theta = -\frac{3\sqrt{5}}{5}$$

$$\cot \theta = -\frac{\sqrt{5}}{2}$$

Algebra 2A

10.3B

Name Key
Assignment

Review from 10.2

Find one positive and one negative angle coterminal with each given angle.

1) 1260° positive: 900° negative: 180°

2) -720° positive: 360° negative: -360°

3) $\frac{9}{4}\pi$ positive: $\frac{\pi}{4}$ negative: $-\frac{7\pi}{4}$

4) Rewrite each degree measure in radians.

$$495^\circ = \frac{11\pi}{4}$$

$$-810^\circ = -\frac{9\pi}{2}$$

5) Rewrite each radian measure in degrees.

5a) $-\frac{7\pi}{2} = -630^\circ$

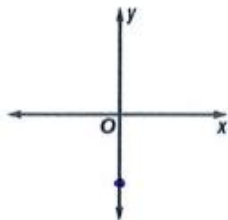
5b) $5\pi = 900^\circ$

5c) $\frac{15\pi}{4} = 675^\circ$

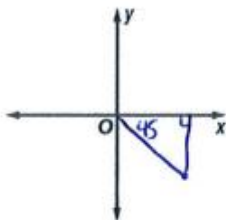
5d) $\frac{-9\pi}{2} = -810^\circ$

Find the exact values of the following. Use the unit circle!

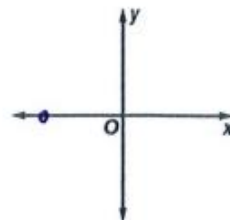
$$\cos \frac{15\pi}{2} = \underline{0}$$



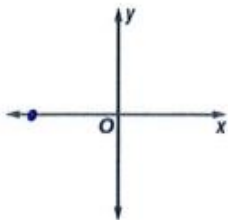
$$\sin \frac{-\pi}{4} = \underline{-\frac{\sqrt{2}}{2}}$$



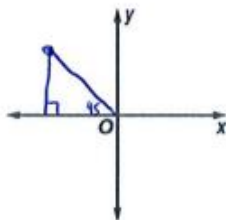
$$\tan 5\pi = \underline{0}$$



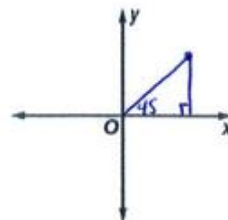
$$\cos 90^\circ = \underline{-1}$$



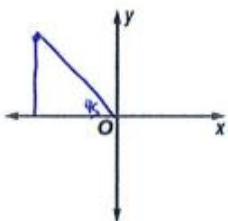
$$\sin 495^\circ = \underline{\frac{\sqrt{2}}{2}}$$



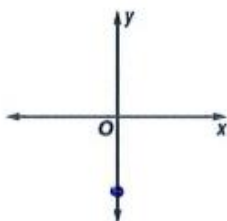
$$\tan 405^\circ = \underline{1}$$



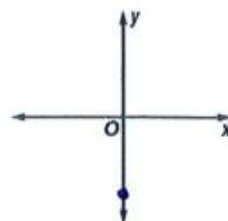
$$\cos \frac{-13}{4}\pi = \underline{-\frac{\sqrt{2}}{2}}$$



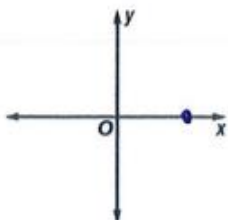
$$\sin \frac{7}{2}\pi = \underline{-1}$$



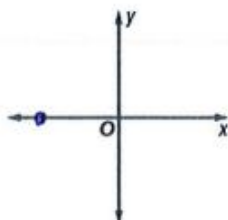
$$\tan \frac{-\pi}{2} = \underline{\text{undefined}}$$



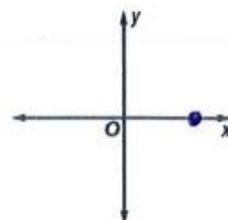
$$\cos 720^\circ = \underline{1}$$



$$\sin -540^\circ = \underline{0}$$



$$\tan 1080^\circ = \underline{0}$$



Algebra 2A

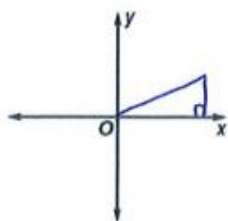
Name Key

10.3C

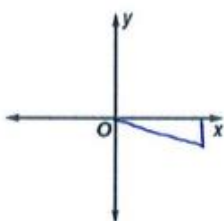
Assignment

Draw the given angle. Use reference angles and the unit circle to find the exact values of:

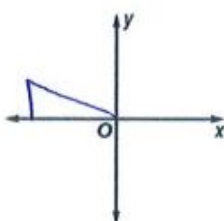
$\cos 30^\circ = \frac{\sqrt{3}}{2}$



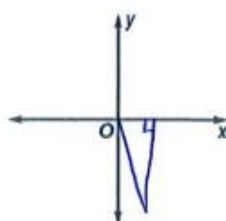
$\sin \frac{-\pi}{6} = -\frac{1}{2}$



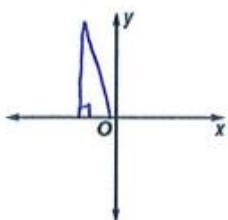
$\sin 510^\circ = \frac{1}{2}$



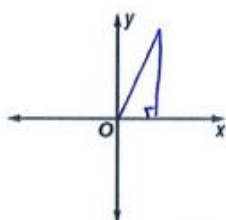
$\tan -60^\circ = -\sqrt{3}$



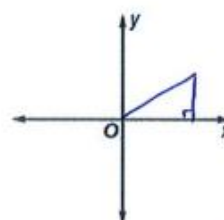
$\cos 120^\circ = -\frac{1}{2}$



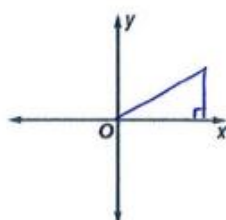
$\sin 420^\circ = \frac{\sqrt{3}}{2}$



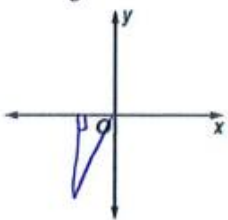
$\cos 390^\circ = \frac{\sqrt{3}}{2}$



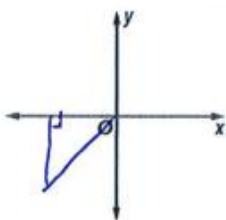
$\tan 30^\circ = \frac{\sqrt{3}}{3}$



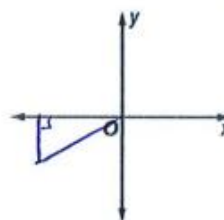
$\cos \frac{-8\pi}{3} = -\frac{1}{2}$



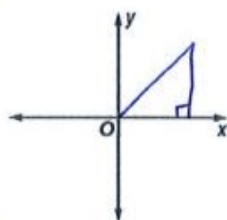
$\sin 225^\circ = -\frac{\sqrt{2}}{2}$



$\cos 930^\circ = -\frac{\sqrt{3}}{2}$



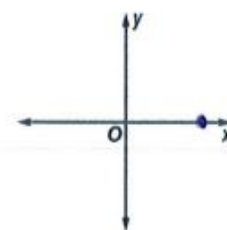
$\tan 45^\circ = 1$



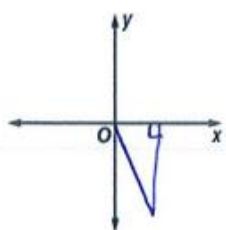
$\cos 990^\circ = 0$



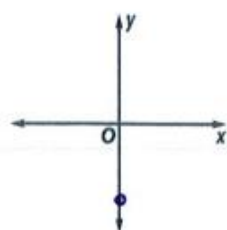
$\sin 1080^\circ = 0$



$\cos 1020^\circ = \frac{1}{2}$



$\tan 630^\circ = \text{undefined}$



Assignment

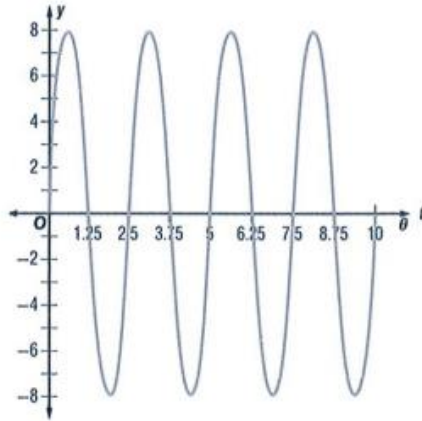
10.4

1. As Charles swims a 25 meter sprint, the position of his right hand relative to the water surface can be modeled by the graph below, where h is the height of the hand in inches from the water level and t is the seconds past the start of the sprint. What function describes this graph?

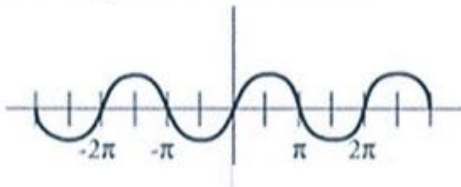
a. Sine or Cosine? Sine

Justify your answer. crosses at (0,0) and increases

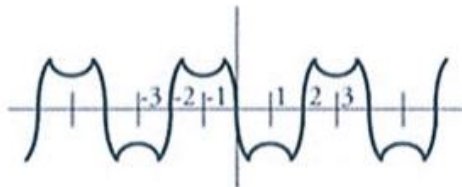
b. What is the amplitude of the function? 8



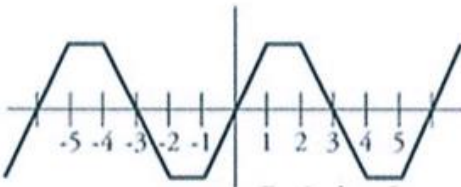
2. What is the period of each function?



(a) 2π



(b) 4



(c) 6



(d) 2