

Name: \_\_\_\_\_

AK

Date: \_\_\_\_\_

Chapter 6 Review

Non-Calculator

1. In radians, what is  $\frac{1}{14}$  of a full rotation?  $\frac{2\pi}{14} = \frac{\pi}{7}$

2. In radians, what is an angle between 0 and  $2\pi$  that is coterminal to  $\frac{15\pi}{6}$ ?  $-2\pi = \frac{3\pi}{6} = \frac{\pi}{2}$

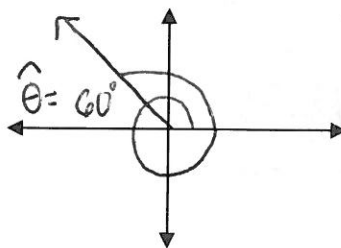
3. In radians, what are (a) the complement and (b) the supplement of  $\frac{\pi}{6}$ ?  $\frac{\pi}{3}$   $\frac{5\pi}{6}$

4. For  $\theta = \frac{8\pi}{3}$ :

$8 \cdot 60 = 480^\circ$

a. Convert to degrees. 480°

b. Draw  $\theta$  in standard position.



c. Name the reference angle in degrees and radians.

$\theta = 60^\circ, \pi/3$

5. Find the exact values for:

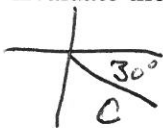
$\sin \frac{15\pi}{6} = \frac{\sqrt{3}}{2}$   $\sec \frac{15\pi}{6} = \frac{2\sqrt{3}}{3}$

6. Convert  $\frac{15\pi}{2}$  to degrees. 1350°

$15 \cdot 90 = 900 + 450 = 1350^\circ$

7. Convert  $225^\circ$  to radians. ~~5\pi/4~~  $5\pi/4$

8. Evaluate the six trig functions for  $\theta = 330^\circ$ .



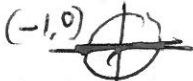
$\sin \theta = -1/2$   $\csc \theta = -2$   
 $\cos \theta = \sqrt{3}/2$   $\sec \theta = 2\sqrt{3}/3$   
 $\tan \theta = -\sqrt{3}/3$   $\cot \theta = -\sqrt{3}$

9. Evaluate the expression  $3(\csc \frac{9\pi}{4})$ .

$\sin \frac{9\pi}{4} = \sin \frac{\pi}{4} = \frac{\sqrt{2}}{2} \rightarrow \csc \frac{9\pi}{4} = \sqrt{2}$

$3\sqrt{2}$

10. Where on the unit circle is  $\cos \theta = -1$ ? Name the angle(s) in radians.



$\theta = \pi$

11. How far does the tip of the 1 inch minute hand of a watch rotate in 15 minutes? Round to the nearest tenth of an inch.

$r = 1$

$s = r\theta$

$\theta = \pi/2$

$s = \pi/2 \approx 1.57$  in

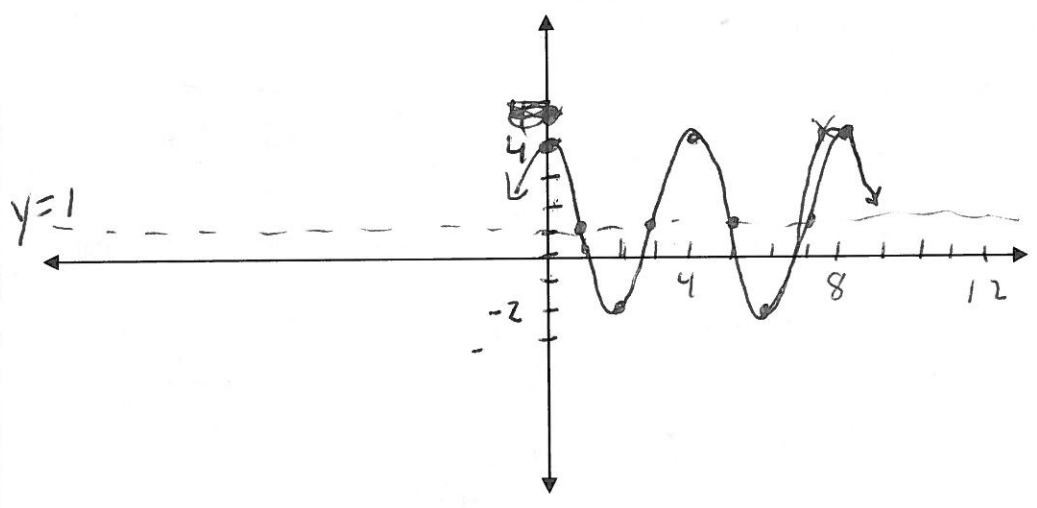
12. Use the even or odd (circle which one) property to find  $\tan(-135^\circ)$ .

$-\tan(135^\circ)$

$-(-1) = 1$

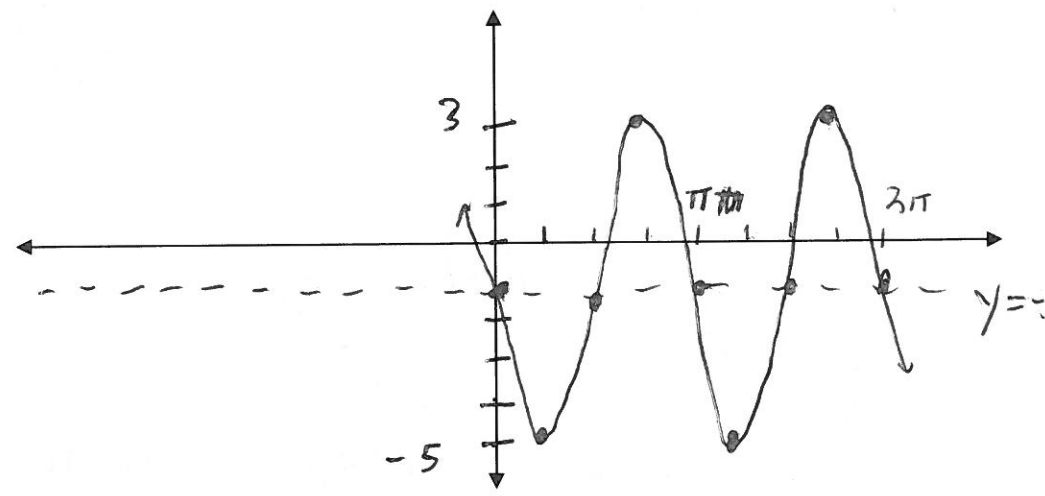
13.  $y = 3 \cos\left(\frac{\pi}{2}x\right) + 1$

Guide Graph Info:  
 $A = 3$   
 $B = \frac{\pi}{2}$   
 $P = 4 \quad 2\pi \div \frac{\pi}{2}$   
 Increment =  $1$   
 S.A.  $y = 1$   
 SP =  $(0, 4)$   
 Domain:  $x \in \mathbb{R}$   
 Range:  $y \in [-2, 2]$



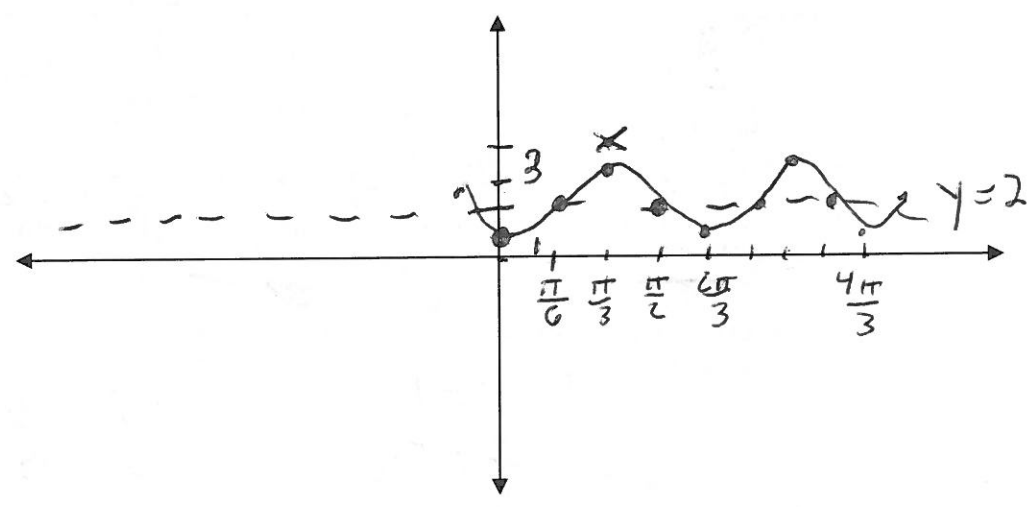
14.  $y = -4 \sin(2x) - 1$

Graph Info:  
 $A = 4$   
 $B = 2$   
 $P = \frac{2\pi}{2} = \pi$   
 Increment =  $\frac{\pi}{4}$   
 S.A.  $y = -1$   
 SP =  $(0, -1)$   
 Domain:  $x \in \mathbb{R}$   
 Range:  $y \in [-5, 3]$



15.  $y = \cos(3x) + 2$

$A = 1$   
 $B = 3$   
 $P = \frac{2\pi}{3}$   
 Increment =  $\frac{2\pi}{12} = \frac{\pi}{6}$   
 S.P =  $(0, 1)$   
 Domain:  $x \in \mathbb{R}$   
 Range:  $y \in [1, 3]$



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Calculator

16. Find  $\theta$  if  $\sec\theta = -1.140$  and terminates in QIII with  $0^\circ < \theta < 360^\circ$ . Round to the nearest degree.

~~$\cos\theta = -1.140$~~   
 $\cos^{-1}\left(+\frac{1}{1.14}\right) = \hat{\theta} = 28.7^\circ$       $\theta = 180 + 28.7$   
208.7°

17. Convert 3 radians to degrees. Round to the nearest tenth.

$3 \cdot \frac{180}{\pi} = \frac{540}{\pi} = 172^\circ$

18. Through how many radians does the minute hand of a clock turn during a 40 minute period? What about the hour hand? Leave your answer in terms of pi.

$\frac{\theta}{2\pi} = \frac{40}{60} \rightarrow$   (Min)

Hour:  $\frac{\theta}{\frac{\pi}{6}} = \frac{40}{60}$       $\theta = \frac{\pi}{9}$   
 $\frac{1}{12} \cdot 2\pi \rightarrow \frac{\pi}{6}$

19. Find  $\theta$  if  $\sin\theta = -0.8846$  and terminates in QIII with  $0^\circ < \theta < 360^\circ$ . Leave a degree and radian answer. Round your degree to the nearest degree and your radian to the nearest tenth.

$\hat{\theta} = \sin^{-1}(.8846) = 62^\circ$       $180 + 62 = 242^\circ$  or  $\frac{242\pi}{180} \approx 4.2$  rad

20. The minute hand of a clock is 1.2 cm long. The hour hand is .9 cm. How much farther does the tip of the minute hand travel than the hour hand in 37 minutes? (round everything in your solution to three decimal places at least so that you don't get the wrong answer because of rounding).

Min:  $S = 1.2 \left(\frac{37}{60} \cdot 2\pi\right) = 4.65$      Hour:  $S = .9 \left(\frac{37}{60} \cdot \frac{\pi}{6}\right) = 0.29$

4.36

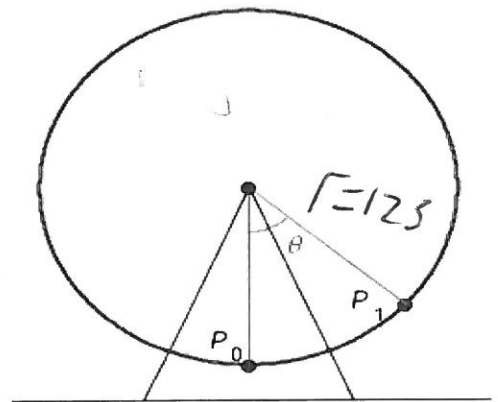
21. If a 74.5 ft flagpole casts a shadow 38.3 ft long, what is the angle of elevation of the sun (to the nearest tenth of a degree)?



$\tan^{-1}\left(\frac{74.5}{38.3}\right) = 63^\circ$

22. The figure given is a model of George Ferris's Ferris wheel. The diameter of the wheel is 250 feet; and  $\theta$  is the central angle formed as a rider travels from his or her initial position  $P_0$  to position  $P_1$ . Find the distance traveled by the rider if  $\theta = 83^\circ$ .

$S = r\theta$   
 $125 \left(\frac{83 \cdot \pi}{180}\right)$   
S = 180.9



23. Does the point  $\left(-\frac{1}{\sqrt{7}}, \frac{2}{\sqrt{7}}\right)$  lie on the unit circle? Why or why not?

$\left(-\frac{1}{\sqrt{7}}\right)^2 + \left(\frac{2}{\sqrt{7}}\right)^2 = \frac{1}{7} + \frac{4}{7} \neq 1$

No

