H-Pre-Calculus Unit 4 Review

1. I can sketch a positive or negative rotation and find co-terminal angles.

Determine the quadrant that each angle lies and find a positive and a negative coterminal angle.

a. $\theta = \frac{-5\pi}{6}$ b. $\theta = \frac{7\pi}{4}$ c. $\theta = 2.5$

d. $\theta = \frac{11\pi}{3}$ e. $\theta = \frac{-13\pi}{4}$ f. $\theta = 420^o$

2. I can convert between degrees/radians.

Convert the following angle measures from degrees to radians.

a. 153^o b. 521.5^o c. -71^o

Convert the following angle measures from radians to degrees.

d. $\frac{5\pi}{7}$ e. $\frac{12\pi}{5}$ f. -5.5

3. I can define radians in terms of arc length and radius and solve for unknowns.

Find the length of the arc intercepted by a central angle with the given radius.

a. $\theta = \frac{5\pi}{6}$ $r = 3$ *inches* b. $\theta = 173^o$ $r = 12$ *feet*

5. I can define and evaluate the six trig functions in terms of x and y on the unit circle.

Evaluate the six trigonometric functions of the real number.

a. $t = \frac{2\pi}{3}$ b. $t = \frac{-3\pi}{4}$ c. $t = \frac{11\pi}{6}$

7. I can identify the "important" angles (degree and radian) and the (x, y) coordinate on the unit circle.

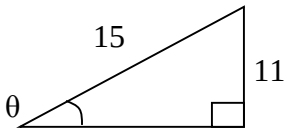
a. Draw a unit circle and complete the important points – degree, radian, and (x, y) points.

b. Evaluate exactly $\cos\frac{\pi}{3} + \tan\frac{2\pi}{3} + \sin\frac{5\pi}{6}$.

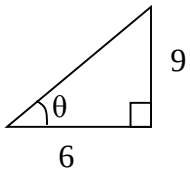
8. I can use a triangle and 2 given sides to evaluate the six trig functions.

Find the exact values of the six trigonometric functions of the angle θ.

a.



b.



9. I can simplify and evaluate trig expressions.

a. Given $\mathbf{cos}(\theta) = \frac{2}{7}$ in a right triangle, determine the other five trig functions.

b. Given $\mathbf{tan}(\theta) = \frac{9}{4}$ in a right triangle, determine the other five trig functions.

10. I can use inverse trig functions to find Θ in both radians and degrees by memory or with a calculator.

Evaluate exact values for θ when possible, otherwise use a calculator. Give both the degree & radian measure. Assume θ is in the first quadrant.

a. $\mathbf{sin}(\theta) = \frac{\sqrt{3}}{2}$ b. $\mathbf{cos}(\theta) = \frac{1}{2}$ c. $\mathbf{tan}(\theta) = \frac{\sqrt{3}}{3}$

d. $\mathbf{sin}(\theta) = \frac{\sqrt{2}}{3}$ e. $\mathbf{cos}(\theta) = \frac{1}{4}$ f. $\mathbf{tan}(\theta) = \frac{17}{2}$

11. I can evaluate trig functions at a given angle by memory or with a calculator.

Find exact values for θ when possible, otherwise use a calculator. Assume θ is in the first quadrant.

a. $\mathbf{csc}(120^o)$ c. $\mathbf{tan}\left(\frac{5\pi}{6}\right)$ e. $\mathbf{sec}\left(\frac{7\pi}{3}\right)$

12. I can solve real world trig problems with sine, cosine and tangent

a. A person standing 100 meters from the base of a vertical tower places a transit on the ground and determines the angle of elevation to the top of the tower is 4.749°. Determine the height of the tower.

b. A building has a row of lights around the sides of the building 30 feet below the top of the building. A marker on the street that approaches the building notes that the angle of elevation to the top of the building is 10° and the angle of elevation to the row of lights is 6°. How far from the building is the marker on the street and how tall is the building?

c. The sonar of a navy cruiser detects a submarine that is 7000 feet from the cruiser. The angle between the water level and the submarine is 25°. How deep is the submarine?

13. I can determine the six trig functions exact value given a point on the terminal side of an angle in standard position.

a. Given the point (5, -7) on the terminal side of an angle, determine the six trig functions.
b. Given the point (-6, -4) on the terminal side of an angle, determine the six trig functions.
c. Given the point (-3, 8) on the terminal side of an angle, determine the six trig functions.

14. I can evaluate trig values given one value and other information.

a. Given $\sin\theta = \frac{3}{4}$ and $\cos\theta < 0$, evaluate $\tan\theta$ and $\sec\theta$.

b. Given $\tan\theta = \frac{7}{4}$ and $\sec\theta < 0$, evaluate $\sin\theta$ and $\cos\theta$.

c. Given $\sin\theta = \frac{3}{5}$ and θ is in Quadrant II, evaluate $\cos\theta$ and $\sec\theta$.

d. Given $\tan\theta = \frac{-5}{3}$ and θ is in Quadrant IV, evaluate $\sin\theta$ and $\sec\theta$.

15. I can find the reference angle of a rotation.

Find the reference angle of each of the following.

a. $\theta = 315^\circ$ d. $\frac{19\pi}{4}$

H-Pre-Calculus
Chapter 4A Target Answers

1a. $III,\ \frac{7\pi}{6},\ \frac{-17\pi}{6}$

1b. $IV,\ \frac{15\pi}{4},\ \frac{-\pi}{4}$

1c. $II,\ 2.5+2\pi,\ 2.5-2\pi$

1d. $IV,\ \frac{5\pi}{3},\ \frac{-\pi}{3}$

1e. $II,\ \frac{3\pi}{4},\ \frac{-5\pi}{4}$

1f. $I,\ 60^o,\ -300^o$

1g. $II,\ \textbf{sup}\ \frac{\pi}{6}$

1h. III

1i. $II,\ \textbf{sup:}\ \pi-3$

2a. 2.670

2b. 9.102

2c. -1.239

2d. 128.571^0

2e. 432^0

2f. -315.127^0

2g. $153^0 39' 28.8"$

2h. $521^0 30' 0"$

2j. $-71^o 7' 22.8"$

3a. s = 7.854 in

3b. s = 36.233 ft.

4a. $\omega = 4.398\ \frac{rad}{\textbf{sec}}$

$linear\ speed = 105.558\ \frac{in}{\textbf{sec}}$

4b. $\omega = 25.133\ \frac{rad}{\textbf{sec}}$

$linear\ speed = 22.848\ \frac{mi}{hr}$

	5a.	5b.	5c.
sin(t)	$\frac{\sqrt{3}}{2}$	$\frac{-\sqrt{2}}{2}$	$\frac{-1}{2}$
cos(t)	$\frac{-1}{2}$	$\frac{-\sqrt{2}}{2}$	$\frac{\sqrt{3}}{2}$
tan(t)	$-\sqrt{3}$	1	$\frac{-\sqrt{3}}{3}$
cot(t)	$\frac{-\sqrt{3}}{3}$	1	$-\sqrt{3}$
sec(t)	–2	$-\sqrt{2}$	$\frac{2\sqrt{3}}{3}$
csc(t)	$\frac{2\sqrt{3}}{3}$	$-\sqrt{2}$	–2

6a. even: cosine, secant
Odd: sine, tangent, cotangent, cosecant

6b. -3

6c. $\varnothing$

7a. See your unit circle

7b. $1-\sqrt{3}$

	8a.	8b.
sin(θ)	$\frac{11}{15}$	$\frac{9\sqrt{117}}{117}$
cos(θ)	$\frac{2\sqrt{26}}{15}$	$\frac{6\sqrt{117}}{117}$
tan(θ)	$\frac{11\sqrt{26}}{52}$	$\frac{3}{2}$
cot(θ)	$\frac{2\sqrt{26}}{11}$	$\frac{2}{3}$
sec(θ)	$\frac{15\sqrt{26}}{52}$	$\frac{\sqrt{117}}{6}$
csc(θ)	$\frac{15}{11}$	$\frac{\sqrt{117}}{9}$

9.	a	b.
sin(θ)	$\frac{3\sqrt{5}}{7}$	$\frac{9\sqrt{97}}{97}$
cos(θ)	$\frac{2}{7}$	$\frac{4\sqrt{97}}{97}$
tan(θ)	$\frac{3\sqrt{5}}{2}$	$\frac{9}{4}$
cot(θ)	$\frac{2\sqrt{5}}{15}$	$\frac{4}{9}$
sec(θ)	$\frac{7}{2}$	$\frac{\sqrt{97}}{4}$
csc(θ)	$\frac{7\sqrt{5}}{15}$	$\frac{\sqrt{97}}{9}$

9c. $\textbf{sin}(\theta) = \frac{5\sqrt{13}}{19}$

$\textbf{cos}(\theta) = \frac{6}{19}$

$\textbf{cos}(90-\theta) = \frac{5\sqrt{13}}{19}$

10a. $60^o,\ \frac{\pi}{3}$

10b. $60^o,\ \frac{\pi}{3}$

10c. $30^o,\ \frac{\pi}{6}$

10d. $28.126^o,\ 0.491$

10e. $75.522^o,\ 1.318$

10f. $83.290^o,\ 1.454$

11a. $\frac{-2\sqrt{3}}{3}$

11b. 1.0257

11c. $\frac{-\sqrt{3}}{3}$

11d. 1.074

11e. 2

11f. -0.066

12a. 8.308 meters

12b. 421.214 feet, 4.271 feet

12c. 2958.328 feet

13.	a.	b.	c.
sin(θ)	$\frac{-7\sqrt{74}}{74}$	$\frac{-2\sqrt{13}}{13}$	$\frac{8\sqrt{73}}{73}$
cos(θ)	$\frac{5\sqrt{74}}{74}$	$\frac{-3\sqrt{13}}{13}$	$\frac{-3\sqrt{73}}{73}$
tan(θ)	$\frac{-7}{5}$	$\frac{2}{3}$	$\frac{-8}{3}$
cot(θ)	$\frac{-5}{7}$	$\frac{3}{2}$	$\frac{-3}{8}$
sec(θ)	$\frac{\sqrt{74}}{5}$	$\frac{-\sqrt{13}}{3}$	$\frac{-\sqrt{73}}{3}$
csc(θ)	$\frac{-\sqrt{74}}{7}$	$\frac{-\sqrt{13}}{2}$	$\frac{\sqrt{73}}{8}$

14a. $\textbf{tan}\,\theta = \frac{-3\sqrt{7}}{7}$,

$\textbf{sec}\,\theta = \frac{-4\sqrt{7}}{7}$

14b. $\textbf{sin}\,\theta = \frac{-7\sqrt{65}}{65}$,

$\textbf{cos}\,\theta = \frac{-4\sqrt{65}}{65}$

14c. $\textbf{cos}\,\theta = \frac{-4}{5}$

$\textbf{sec}\,\theta = \frac{-5}{4}$

14d. $\textbf{sin}\,\theta = \frac{-5\sqrt{34}}{34}$

$\textbf{sec}\,\theta = \frac{\sqrt{34}}{3}$

14e. 105^o or 285^o

15a. 45^o

15b. 0.992 radians

15c. 1.216 radians

15d. $\frac{\pi}{4}\ radians$

16a. see 14a

16b. see 14b

16c. see 14c

16d. see 14d