Name: _____   Date: _____

Period: _____   Trig Chapter 3 Review

Please write neatly in the space provided, showing all work. If the problem calls for an exact value, you may *not* use your calculator to evaluate the trig function.

1. For the angle, 585°
   a. Draw the angle in standard position. $585 - 360 = 225°$ (coterminal)
   b. Convert to radian measure using exact values.
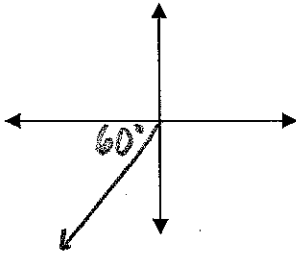   c. Name the reference angle in both degrees and radians.
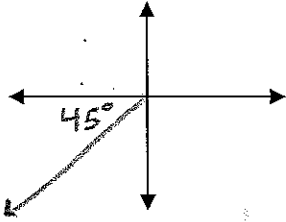
b) $585 \left(\frac{\pi}{180}\right) = \frac{585\pi}{180} = \frac{13\pi}{4}$

or $585 = 360 + 225 = 2\pi + \frac{5\pi}{4} = \frac{13\pi}{4}$

c) $\hat{\theta} = 45°$ or $\frac{\pi}{4}$

2. For the angle $\frac{10\pi}{3}$,
   a. Convert to degree measure. $10 \left(\frac{\pi}{3}\right) = 10(60°) = 600°$
   b. Draw the angle in standard position. $600 - 360 = 240°$ (coterminal)
   c. Name the reference angle in both degrees and radians.

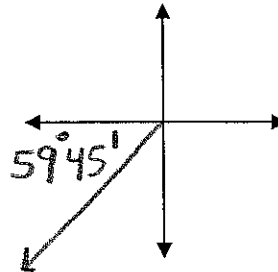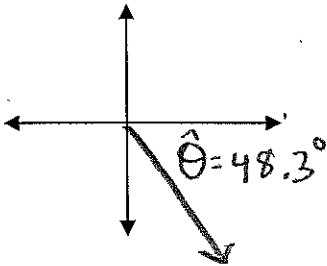$\hat{\theta} = 60°$ or $\frac{\pi}{3}$

3. Draw θ in standard position and name the reference angle.
   a. 311.7°   b. $-120°\ 15'$

$\hat{\theta} = 48.3°$

$59°45'$

4. Find the exact value for the following:
   a. $\sec -120° = \boxed{-2}$
       $\cos(-120) = \cos(120)$
       $= -\cos(60) = -\frac{1}{2}$

   b. $\csc 570° = \boxed{-2}$
       $\sin 570 = \sin(210)$
       $= -\sin 30 = -\frac{1}{2}$

   c. $\tan -45° = \boxed{-1}$
       $\tan(-45)$
       $= -\tan(45)$

   d. $\cos \frac{7\pi}{2} = \boxed{0}$
       $\cos(630) = \cos 270$
       $= \cos 90 = 0$

   e. $\csc \frac{5\pi}{6} = \boxed{2}$
       $\sin(150) = \sin 30$
       $= \frac{1}{2}$

   e. $\cot \frac{15\pi}{4} = \boxed{-1}$
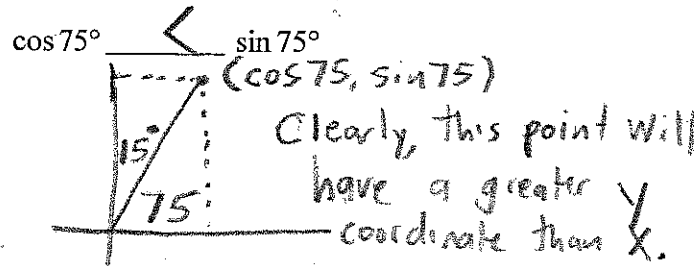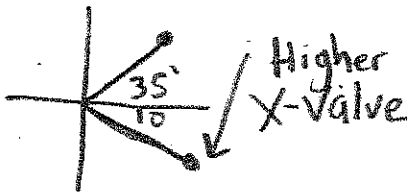 $\tan(675) = \tan(315)$
       $= -\tan(45) = -1$

5. If $\cot \theta = -1.6977$ and θ lies in Q II, find θ to the nearest tenth of a degree is $0° < \theta < 360°$.

$\cot^{-1}(|-1.6977|) = \cot^{-1}(1.6977) = 30.5°$ $\qquad \theta = 180 - 30.5$

$\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad = 149.5°$

6. Complete the inequality:

$\cos 35°$ ___$<$___ $\cos 350°$

$35°$
10
Higher X-Value ✓

$\cos 75°$ ___$<$___ $\sin 75°$

$(\cos 75, \sin 75)$
$15°$
$75°$
Clearly, this point will have a greater Y coordinate than X.

7. If the minute hand of the clock is 10 inches long. What is the distance that the tip of the minute hand moves from 6:15 to 6:40?
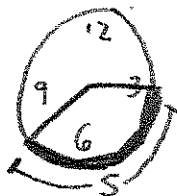
$S = \theta \cdot r$

$\dfrac{25}{60} = \dfrac{\theta}{2\pi}$

$\theta = \dfrac{50\pi}{60}$

$\theta = \dfrac{5\pi}{6}$

$r = 10$

$S = \dfrac{5\pi}{6}(10) \approx 26.2 \text{ inches}$

8. A windshield wiper is 18 inches long, and rotates 75°. If the blade covers the entire wiper what is the area that the blade can clear off?

$A = \dfrac{1}{2}\theta r^2$

$\theta = \dfrac{75\pi}{180}$

$\quad = \dfrac{15\pi}{36} = \dfrac{5\pi}{12}$

$r = 18$

$A = \dfrac{1}{2}\left(\dfrac{5\pi}{12}\right)(18)^2 \approx 212.06 \text{ inch}^2$

9. Is the point $\left(\dfrac{8}{\sqrt{89}}, \dfrac{5}{\sqrt{89}}\right)$ on the unit circle? Why or Why not?

$$x^2 + y^2 = 1$$

$$\left(\dfrac{8}{\sqrt{89}}\right)^2 + \left(\dfrac{5}{\sqrt{89}}\right)^2 = 1$$

$$\left(\dfrac{64}{89}\right) + \left(\dfrac{25}{89}\right) = 1$$

$$\dfrac{89}{89} = 1 \quad ✓ \text{ True, so that is a point on the unit circle.}$$