

Homework 7-3

- | | |
|------------------------|--|
| 1. $\pi/10$ | 10. 83.1° |
| 2. -3π | 11. 435.4° |
| 3. $7\pi/18$ | 12. -206.3° |
| 4. 420° | 13-15 see next slide |
| 5. -540° | 16. minute hand $\rightarrow 360^\circ, 2\pi$
hour hand $\rightarrow 60^\circ, \pi/3$ |
| 6. 105° | 17. π |
| 7. 1.71 rad | 18. $0, \pi$ |
| 8. -3.46 rad | 19. $0, \pi$ |
| 9. 4.71 rad | 20. $\pi/2, 3\pi/2$ |

Name: Keyf

Algebra 2 Homework 7-3

Period: _____

State each angle in radians in terms of π .

1. $18^\circ \left(\frac{\pi}{180} \right) = \frac{\pi}{10}$

2. $-540^\circ \left(\frac{\pi}{180} \right) = -3\pi$

3. $70^\circ \left(\frac{\pi}{180} \right) = \frac{7\pi}{18}$

Convert the radian measures to degrees, rounded to the nearest degree.

4. $\frac{7\pi}{3} \left(\frac{180}{\pi} \right) = 420^\circ$

5. $-3\pi \left(\frac{180}{\pi} \right) = -540^\circ$

6. $\frac{7\pi}{12} \left(\frac{180}{\pi} \right) = 105^\circ$

State each angle to the nearest hundredth of a radian. Do not leave your answer in terms of π .

7. $98^\circ \left(\frac{\pi}{180} \right) = 1.71 \text{ rad}$

8. $-198^\circ \left(\frac{\pi}{180} \right) = -3.46 \text{ rad}$

9. $270^\circ \left(\frac{\pi}{180} \right) = 4.71 \text{ rad}$

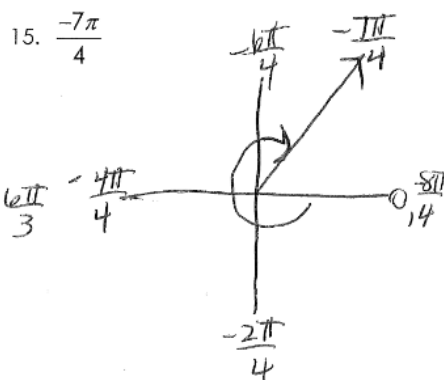
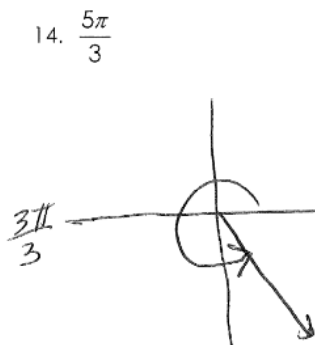
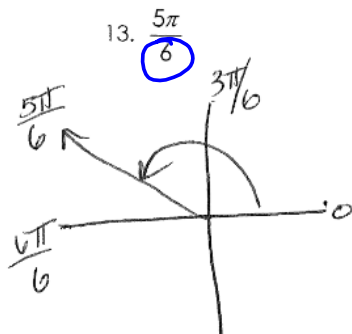
Convert the radian measures to the nearest tenth of a degree.

10. $1.45 \left(\frac{180}{\pi} \right) = 83.1^\circ$

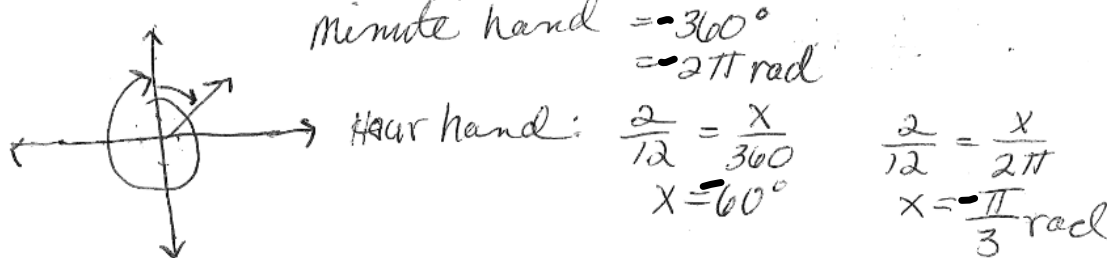
11. $7.6 \left(\frac{180}{\pi} \right) = 435.4^\circ$

12. $-3.6 \left(\frac{180}{\pi} \right) = -206.3^\circ$

Sketch the following angles:



16. A clock starts at midnight. It is now 2 AM. What angle has the minute hand swept through in one hour? What angle has the hour hand swept through in two hours? State both answers in degrees and radians. Hint: Pay special attention to the direction of rotation.



Using the unit circle, find all of the measure of angle θ .

$0 \leq \theta < 2\pi$ **radians!**

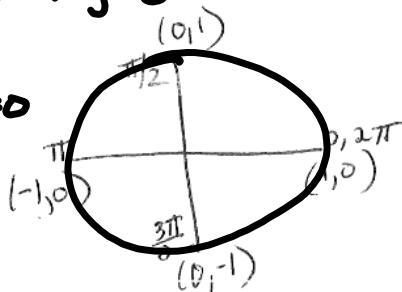
17. $\cos(\theta) = -1$ (means what angle has a cosine = -1?)

18. $\sin(\theta) = 0$

19. $\tan(\theta) = 0$

20. $\tan(\theta) = \text{undefined}$

$\frac{y}{x} = 0 \rightarrow y = 0$
 $\frac{y}{x} \leftarrow x = 0$



π

$0, \pi$

$0, \pi$

$\frac{\pi}{2}, \frac{3\pi}{2}$

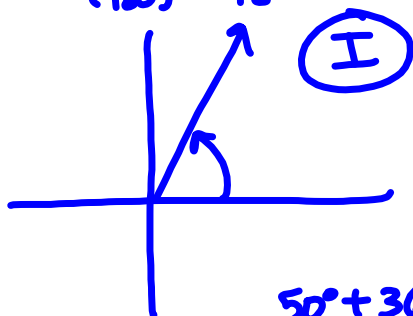
$0 \leq \theta < 360^\circ$
 $\uparrow$
degrees

Day 4: Reference Angles and ASTC

Warm-Up:

- Convert the angle to radians or degrees.
- Sketch the angle in standard position, and determine the quadrant in which the angle lies.
- Find the measures of a positive and negative angle that are coterminal with the given angle.

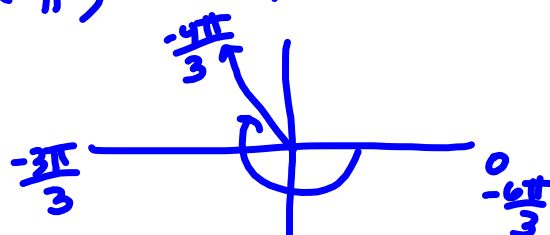
1. $50^\circ \left(\frac{\pi}{180}\right) = \frac{5\pi}{18}$



$$50^\circ + 360^\circ = 410^\circ$$

$$50^\circ - 360^\circ = -310^\circ$$

2. $\frac{-4\pi}{3} \left(\frac{180}{\pi}\right) = -240^\circ$



$$-\frac{4\pi}{3} - \frac{2\pi}{3} = -\frac{10\pi}{3}$$

$$-\frac{4\pi}{3} + \frac{6\pi}{3} = \frac{2\pi}{3}$$

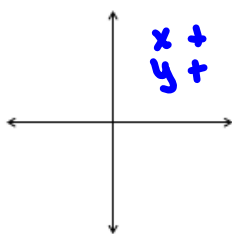
Sine, Cosine and Tangent in Quadrants:

$$\sin(\theta) = y$$

$$\cos(\theta) = x$$

S	A
T	C

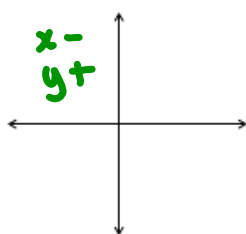
Quad I



$$\begin{array}{l} \sin(\theta) + \\ \cos(\theta) + \\ \tan(\theta) + \end{array}$$

$\frac{y}{x}$ **All**

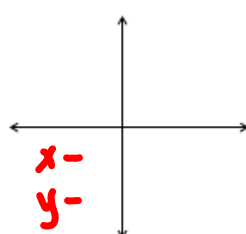
Quad II



$$\begin{array}{l} \sin(\theta) + \\ \cos(\theta) - \\ \tan(\theta) - \end{array}$$

sin

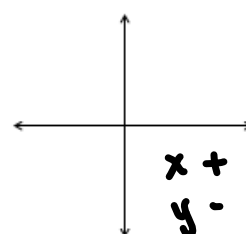
Quad III



$$\begin{array}{l} \sin(\theta) - \\ \cos(\theta) - \\ \tan(\theta) + \end{array}$$

tan

Quad IV



$$\begin{array}{l} \sin(\theta) - \\ \cos(\theta) + \\ \tan(\theta) - \end{array}$$

cos

Determine the quadrant in which angle θ may lie if:

a. $\overset{-}{\tan}(\theta) < 0$ and $\overset{+}{\sin}(\theta) = \frac{3}{5}$

II

b. $\overset{-}{\cos}(\theta) = -1/2$ and $\overset{-}{\sin}(\theta) < 0$

III

c. $\overset{-}{\tan}(\theta) < 0$ and $\overset{-}{\cos}(\theta) < 0$

II

d. $\overset{+}{\tan}(\theta) > 0$ and $\overset{+}{\cos}(\theta) = .6$

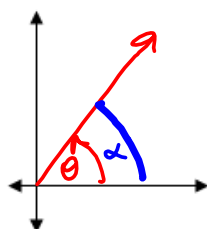
I

S	A
T	C

Definition: A **reference angle** is a positive acute angle formed by the terminal side and the x-axis. It is often denoted by the symbol α .

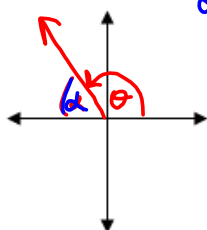
***Note:** Quadrants do not have reference angles.

Quad I:



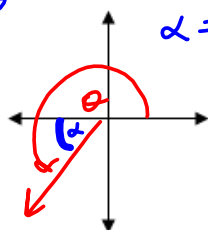
nearest
 $\alpha = \theta$

Quad II



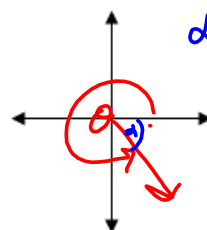
$\alpha = 180^\circ - \theta$

Quad III



$\alpha = \theta - 180^\circ$

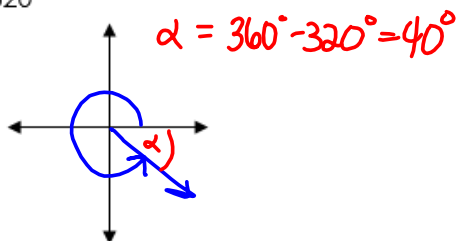
Quad IV



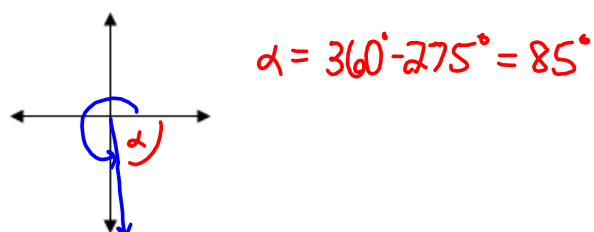
$\alpha = 360^\circ - \theta$

Sketch and find the reference angle:

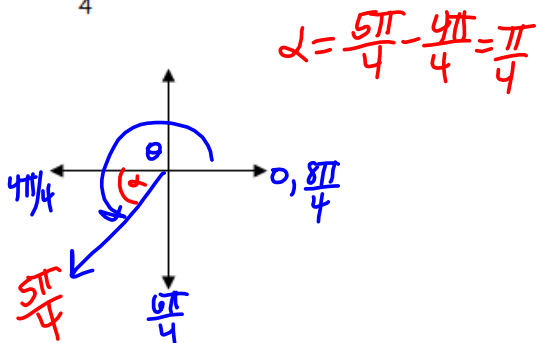
1. 320°



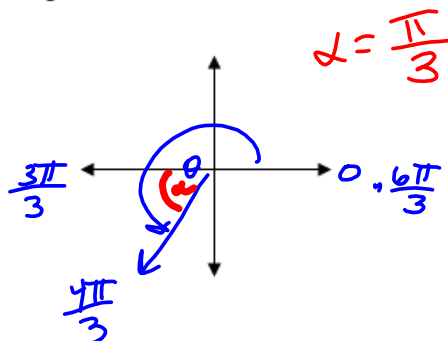
2. 275°



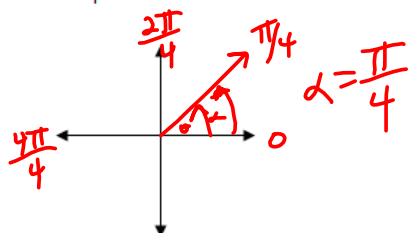
3. $\frac{5\pi}{4}$



4. $\frac{4\pi}{3}$

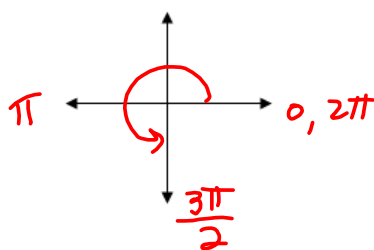


5. $\frac{\pi}{4}$



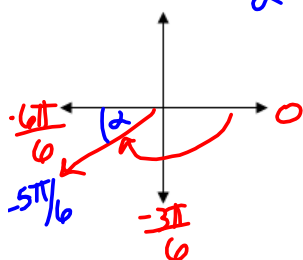
6. $\frac{3\pi}{2}$

Quadrantal!

no ref
angle
for
Quadrantal

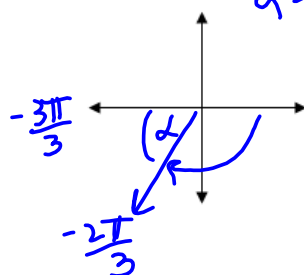
7. $-\frac{5\pi}{6}$

$\alpha = \frac{\pi}{6}$



8. $-\frac{2\pi}{3}$

$\alpha = \frac{\pi}{3}$



9. $-\frac{9\pi}{5}$

$\alpha = \frac{\pi}{5}$

