

Homework 7-3

Do Warm-up #1 & 2 in notes
(GOOD for Quiz!)

NOTE Tues 12/17: Today, reference angles were introduced, but we did not practice any with radian measures. As a result, tonight's HW 7-4: you should do 1ab, 2-8 a part only, 9 and 10.

I am posting completed notes with radian measure reference angles as an fyi. If we need more practice, I will pull these back up.

- | | |
|------------------------|--|
| 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: 360° , 2π
hour hand: 60° , $\pi/3$ |
| 6. 105° | 17. π |
| 7. 1.71 rad | 18. $0, \pi$ |
| 8. -3.46 rad | 19. $0, \pi$ |
| 9. 4.71 rad | 20. $\pi/2, 3\pi/2$ |

Aug 13-1:33 PM

Name: Key Algebra 2 Homework 7-3
Period: _____

State each angle in radians in terms of π .

- $18^\circ \left(\frac{\pi}{180} \right) = \frac{\pi}{10}$
- $-540^\circ \left(\frac{\pi}{180} \right) = -3\pi$
- $70^\circ \left(\frac{\pi}{180} \right) = \frac{7\pi}{18}$

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

- $\frac{7\pi}{3} \left(\frac{180}{\pi} \right) = 420^\circ$
- $-3\pi \left(\frac{180}{\pi} \right) = -540^\circ$
- $\frac{7\pi}{12} \left(\frac{180}{\pi} \right) = 105^\circ$

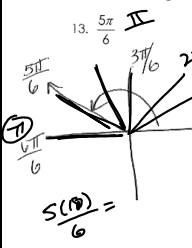
State each angle to the nearest hundredth of a radian. Do not leave your answer in terms of π .

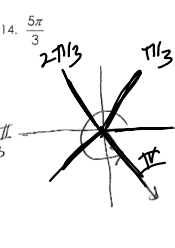
- $\frac{98^\circ}{1} \left(\frac{\pi}{180} \right) = 1.71 \text{ rad}$ $\frac{98\pi}{180} =$
- $-198^\circ \left(\frac{\pi}{180} \right) = -3.46 \text{ rad}$
- $270^\circ \left(\frac{\pi}{180} \right) = 4.71 \text{ rad}$

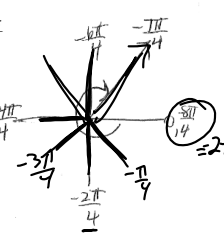
Convert the radian measures to the nearest tenth of a degree.

- $1.45 \left(\frac{180}{\pi} \right) = 83.1^\circ$
- $7.6 \left(\frac{180}{\pi} \right) = 435.4^\circ$
- $-3.6 \left(\frac{180}{\pi} \right) = -206.3^\circ$

Sketch the following angles:

13. $\frac{5\pi}{6}$  $\frac{5\pi}{6}$

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

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

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.

Minute hand = 360° = 2π rad

Hour hand: $\frac{2}{12} = \frac{x}{360}$ $x = 60^\circ$ $\frac{2}{12} = \frac{x}{2\pi}$ $x = \frac{\pi}{3}$ rad

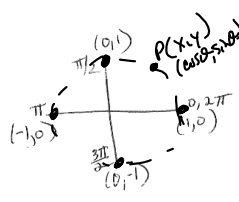
Using the unit circle, find all of the measure of angle θ . $0 \leq \theta < 2\pi$

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

18. $\sin(\theta) = 0$ $(-, 0)$ $0, \pi$

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

20. $\tan(\theta) = \text{undefined}$ $\frac{\pi}{2}, \frac{3\pi}{2}$



$\tan \theta = \frac{\sin \theta}{\cos \theta}$

Day 4: Reference Angles and ASTC

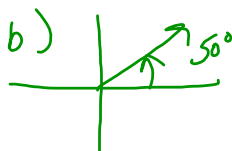
(7-3 notes)

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°

$$a) 50 \cdot \frac{\pi}{180} = \frac{50\pi}{180} = \frac{5\pi}{18}$$



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

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

$$2. \frac{-4\pi}{3} \cdot \frac{180}{\pi} = -240^\circ$$



$$c) -240 + 360 = 120^\circ$$

$$-240 - 360 = -600^\circ$$

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QUIZ

Dec 15-7:11 PM



P on a unit circle
 $(x, y) = (\cos \theta, \sin \theta)$
 $\tan \theta = \frac{\sin \theta}{\cos \theta}$

Sine, Cosine and Tangent in Quadrants:

Quadrant	Signs of $\sin(\theta)$, $\cos(\theta)$, $\tan(\theta)$
Quad I	$\sin(\theta) +$ $\cos(\theta) +$ $\tan(\theta) +$
Quad II	$\sin(\theta) +$ $\cos(\theta) -$ $\tan(\theta) -$
Quad III	$\sin(\theta) -$ $\cos(\theta) -$ $\tan(\theta) +$
Quad IV	$\sin(\theta) -$ $\cos(\theta) +$ $\tan(\theta) -$

Mnemonic:
 S: All
 T: Trig
 Sine: All
 Tangent: Cosine

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Determine the quadrant in which angle θ may lie if:

S	A
T	C

a. $\tan(\theta) < 0$ and $\sin(\theta) = \frac{3}{5}$
~~II, IV~~ **II, I**

b. $\cos(\theta) = -1/2$ and $\sin(\theta) < 0$
~~II, III~~ **III, IV**

c. $\tan(\theta) < 0$ and $\cos(\theta) < 0$
~~II, IV~~ **II**

d. $\tan(\theta) > 0$ and $\cos(\theta) = .6$
~~I, III~~ **I, IV**

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Definition: A reference angle is a nearest + and acute angle formed by the terminal side and the x-axis. It is often denoted by the symbol α (alpha).

Note: Quadrants do not have reference angles.

Quad I: $\alpha_{ref} = \theta$

Quad II: 150°
 $30^\circ = \alpha$
 $ref \angle \alpha = 180 - \theta$
 $180 - 150 = 30^\circ$

Quad III: 200°
 $ref \angle \alpha = \theta - 180$
 $= 200 - 180$
 $\alpha = 20^\circ$

Quad IV: 300°
 $ref \angle \alpha = 360 - \theta$
 $= 360 - 300 = 60^\circ$

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Sketch and find the reference angle:

1. 320°

2. 275°

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

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

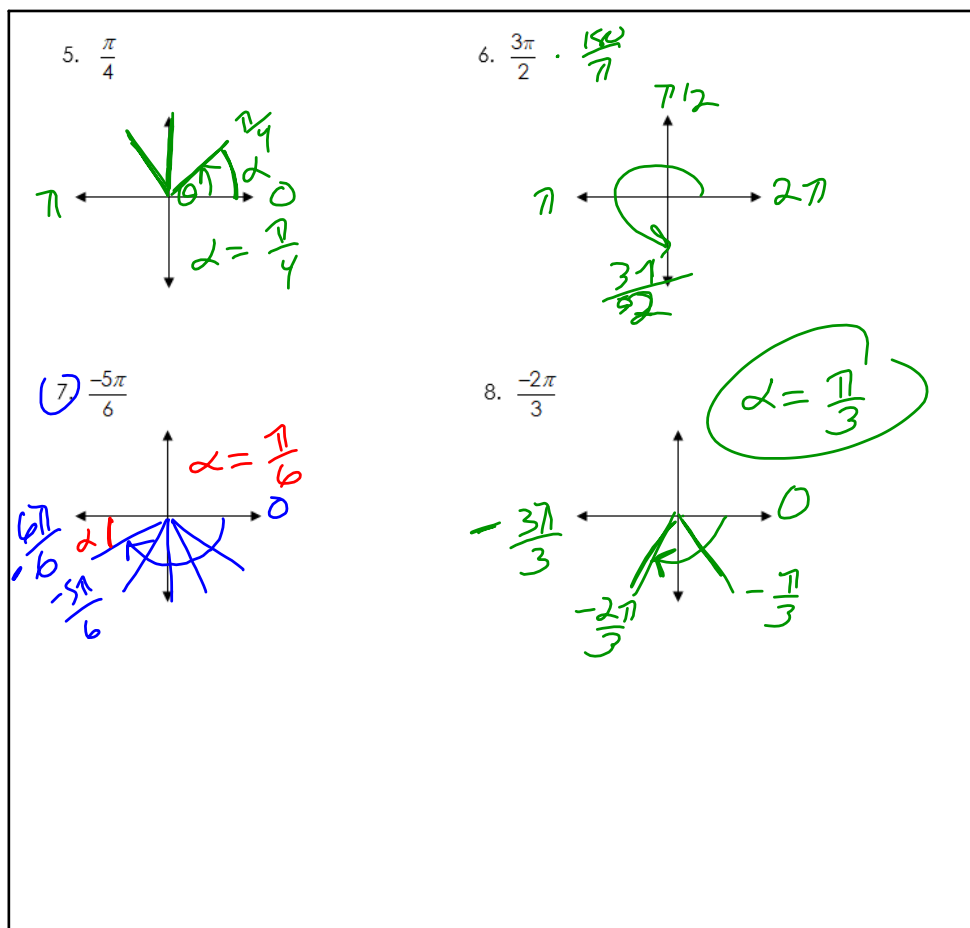
1. 320°
 $\alpha = 40^\circ$

2. 275°
 $\alpha = 360 - 275$
 $= 85^\circ$

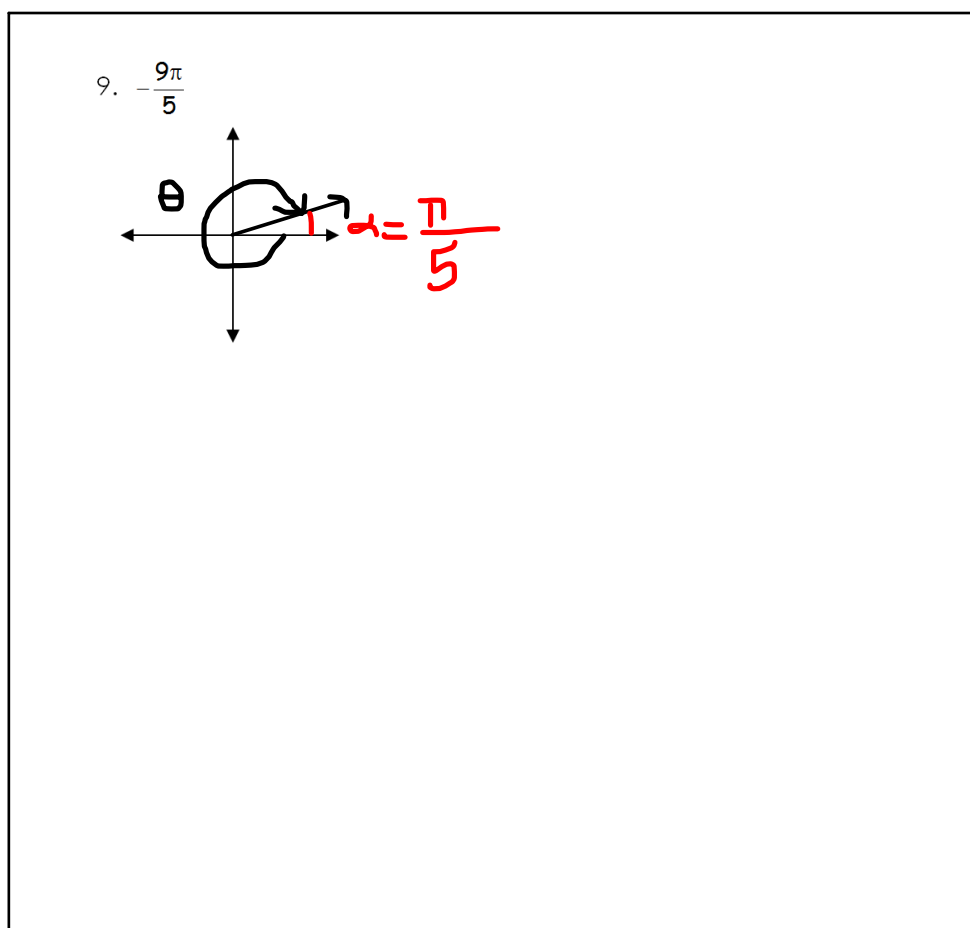
3. $\frac{5\pi}{4}$
 $\alpha = \frac{5\pi}{4} - \frac{4\pi}{4} = \frac{\pi}{4}$

4. $\frac{4\pi}{3}$
 $\alpha = \frac{4\pi}{3} - \frac{3\pi}{3} = \frac{\pi}{3}$

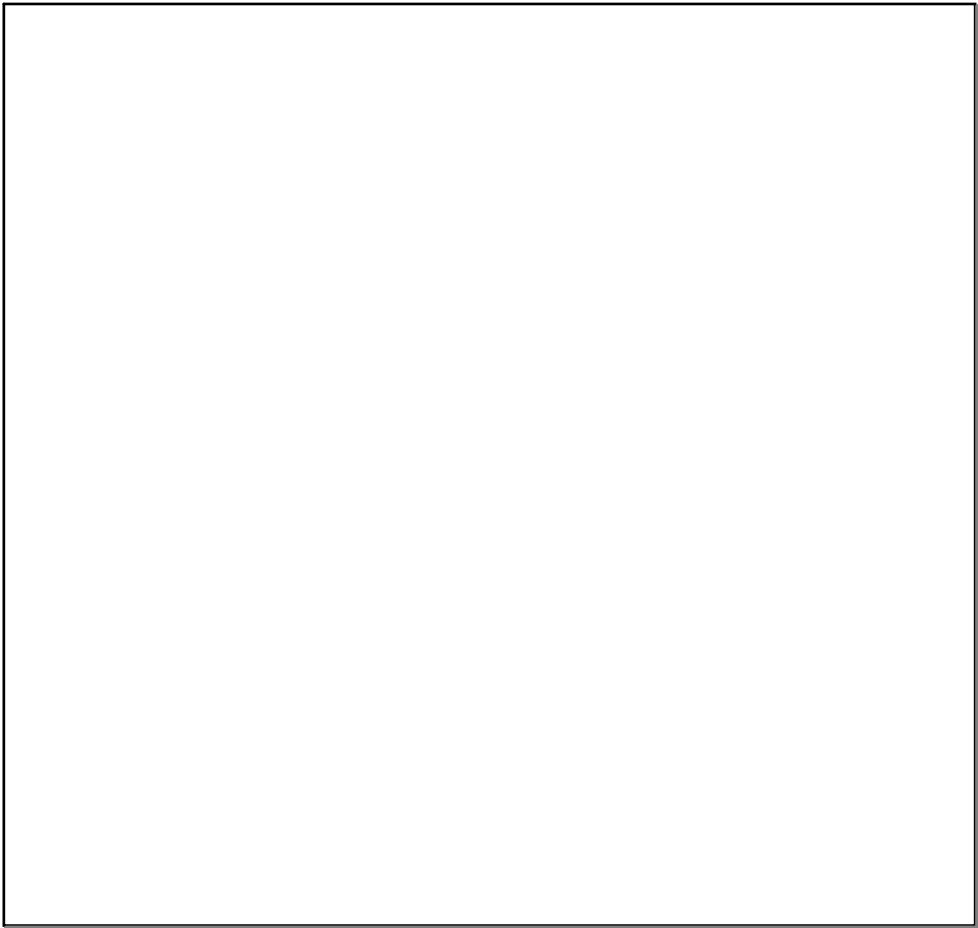
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Dec 16-5:58 PM



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