

Homework 7-1

1. B because Pyth. Thm. doesn't work
2. 22.7 ft
3. 10 miles
4. 12/13
5. $a = 9.0$, $c = 19.3$
6. 12.3 ft
7. 25.2 m
8. ~~12~~ see next slide

~~12~~ 9. 48.8°

Name: key

Algebra 2 Homework 7-1

Period: _____

1. Which of the following sets of side lengths cannot form a right triangle? Explain why.

a. 3, 4, 5

b. 5, 6, 8

c. 8, 15, 17

d. 5, 12, 13

$$3^2 + 4^2 = 5^2$$

yes

$$5^2 + 6^2 \neq 8^2$$

No

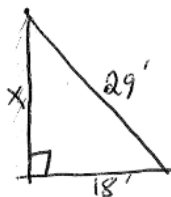
$$8^2 + 15^2 = 17^2$$

yes

$$5^2 + 12^2 = 13^2$$

yes

2. A 29-foot ladder leans against a wall. If the base of the ladder is 18 feet from the wall, to the nearest tenth, how far up the wall is the top of the ladder?



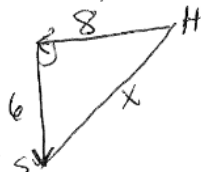
$$x^2 + 18^2 = 29^2$$

$$x^2 + 324 = 841$$

$$\sqrt{x^2} = \sqrt{517}$$

$$x = 22.7 \text{ ft.}$$

3. To get from his house to the grocery store, Tom must drive 8 miles directly west and then 6 miles directly south. If he were to travel by helicopter, how far is Tom's house from the grocery store?



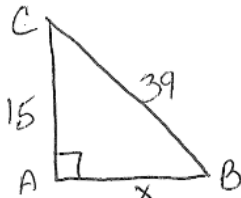
$$6^2 + 8^2 = x^2$$

$$100 = x^2$$

$$10 = x$$

10 miles

4. In a right triangle with acute angles C and B, the value of
- $\sin(B) = \frac{15}{39}$
- . Find the value of
- $\sin(C)$
- .
-
- Express your answer as a fraction in lowest terms.



$$15^2 + x^2 = 39^2$$

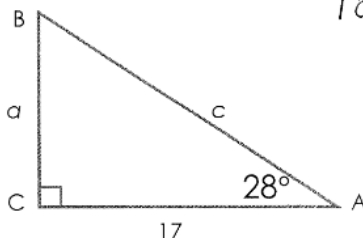
$$225 + x^2 = 1521$$

$$\sqrt{x^2} = \sqrt{1296}$$

$$x = 36$$

$$\sin(C) = \frac{36}{39} = \frac{12}{13}$$

5. What are the lengths of sides a and c in the triangle below? State your answers to the nearest tenth.



$$\tan 28^\circ = \frac{a}{17}$$

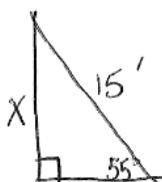
$$a = 17 \tan 28^\circ \approx 9.0$$

$$\cos 28^\circ = \frac{17}{c}$$

$$c \cos 28^\circ = 17$$

$$c = \frac{17}{\cos 28^\circ} \approx 19.3$$

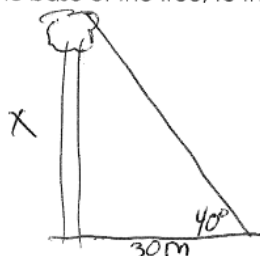
6. A painter uses a 15-foot ladder. When he rests the top of the ladder against the wall, the ladder makes a 55° angle with the floor. How far up the wall does the top of the ladder reach? Round our answers to the nearest tenth of a foot.



$$\sin 55^\circ = \frac{X}{15}$$

$$X = 15 \sin 55^\circ = 12.3 \text{ ft}$$

7. Carrie measures the angle from the ground to the top of a tree as 40° . If she is 30 meters from the base of the tree, to the nearest tenth, how tall is the tree?

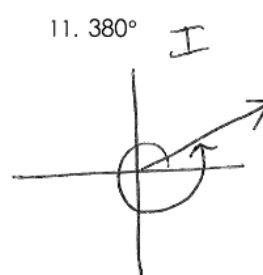
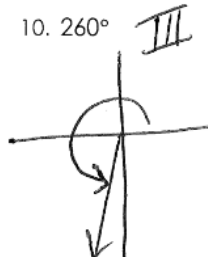
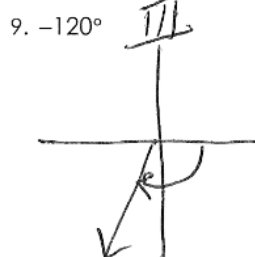
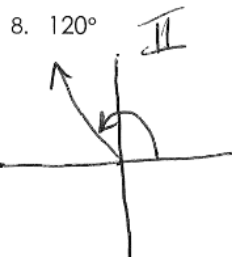


$$\tan 40^\circ = \frac{X}{30}$$

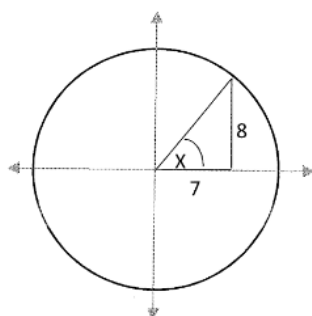
$$X = 30 \tan 40^\circ = 25.2 \text{ m}$$

For the following angles:

- Sketch the angle on standard position
- Determine which quadrant the angle terminates in



12.



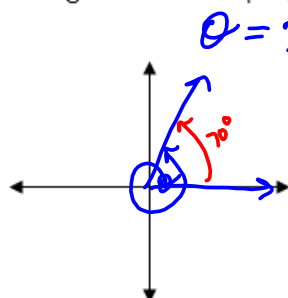
Find $m\angle X$.

$$X = \tan^{-1}\left(\frac{8}{7}\right) = 48.8^\circ$$

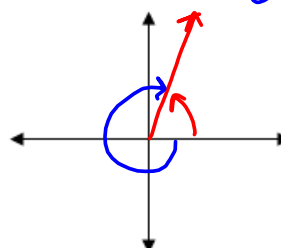
Day 2 – Co-Terminal Angles, Quadrantals and the Unit Circle

Co-terminal Angles: angles that share the same terminal side.

To find positive and negative co-terminal angles, add and subtract 360° to/from the angle. For example, two of the co-terminal angles for 70° are:

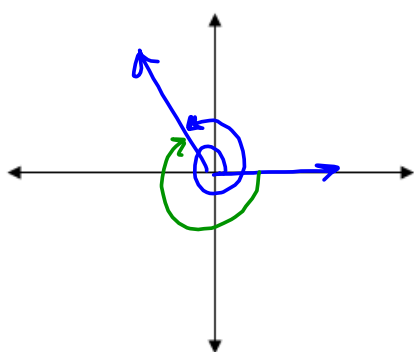


$$\theta = 70^\circ + 360^\circ$$
$$430^\circ$$



$$\theta = 70^\circ - 360^\circ$$
$$-290^\circ$$

Find a positive and negative angle co-terminal with an angle of 120°



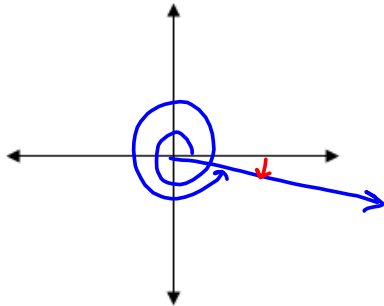
$$120^\circ + 360^\circ = 480^\circ$$

$$120^\circ - 360^\circ = -240^\circ$$

You try:

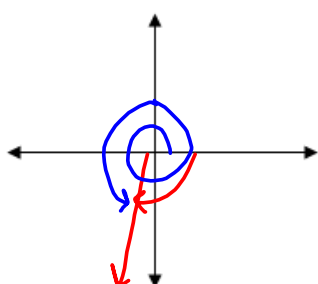
- Determine the quadrant in which the angle lies.
- Find the measures of a positive and negative angle that are coterminal with the given angle.

1. 350°



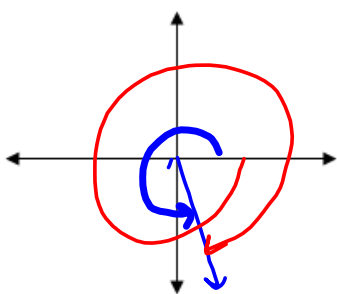
$$350^\circ + 360^\circ = 710^\circ$$

$$350^\circ - 360^\circ = -10^\circ$$

2. 260° 

$$260^\circ + 360^\circ = 620^\circ$$

$$260^\circ - 360^\circ = -100^\circ$$

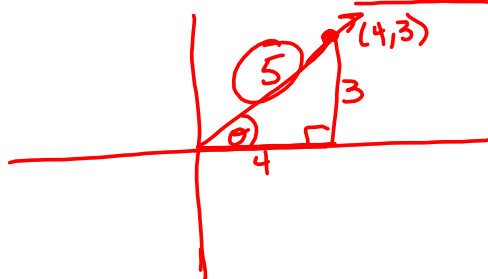
3. -70° 

$$-70^\circ + 360^\circ = 290^\circ$$

$$-70^\circ - 360^\circ = -430^\circ$$

4. The terminal side of $\angle\theta$ passes through the point $(4, 3)$. What are the sine, cosine and tangent of $\angle\theta$? Also, find $m\angle\theta$.

* **Hint:** Draw the angle in standard position first.



$$\sin(\theta) = \frac{3}{5}$$

$$\cos(\theta) = \frac{4}{5}$$

$$\tan(\theta) = \frac{3}{4}$$

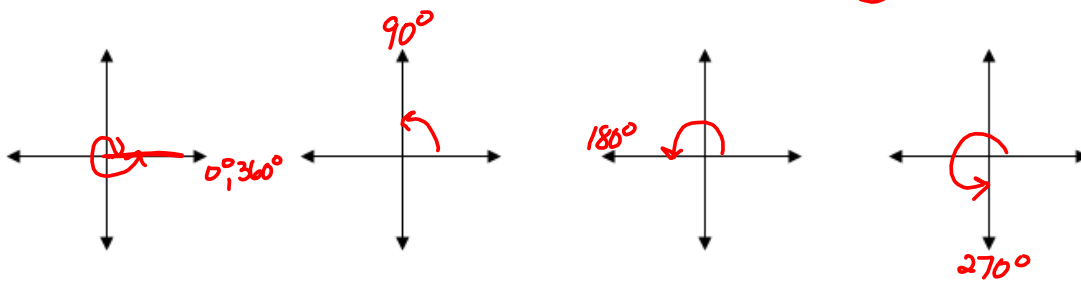
$$m\angle\theta =$$

$$\theta = \sin^{-1}\left(\frac{3}{5}\right) = 37^\circ$$

Quadrantal Angles and the Unit Circle

Quadrantal Angles

Def: Angles whose terminal side is on the x or y axis



Unit Circle →

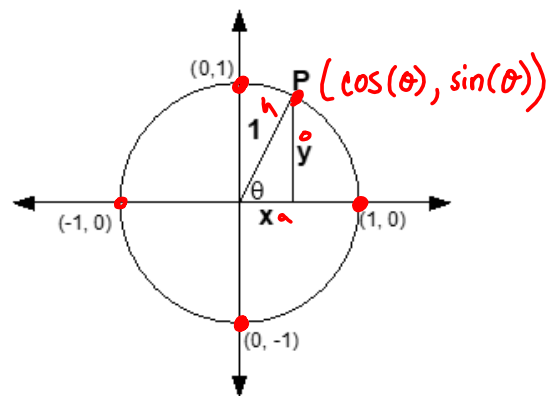
radius = 1

$$\sin(\theta) = \frac{y}{1} = y$$

$$\cos(\theta) = \frac{x}{1} = x$$

$$\tan(\theta) = \frac{y}{x} = \frac{\sin(\theta)}{\cos(\theta)}$$

Coordinates of P: $(\cos(\theta), \sin(\theta))$



Sine, Cosine and Tangent of Quadrantals:

 $(1,0)$ $(0,1)$ $(-1,0)$ $(0,-1)$ same as 0°

Degrees	0°	90°	180°	270°	360°
Radians					
$\sin(\theta)$	0	1	0	-1	0
$\cos(\theta)$	1	0	-1	0	1
$\tan(\theta)$	$\frac{0}{1} = 0$	$\frac{1}{0} = \text{undef.}$	$\frac{0}{-1} = 0$	$\frac{-1}{0} = \text{undef.}$	0

** Tomorrow we will fill in the Radians row.

