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. see next slide

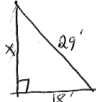9. 48.8°

Aug 13-1:18 PM

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

   $3^2 + 4^2 = 5^2$ $5^2 + 6^2 = 8^2$ $8^2 + 15^2 = 17^2$ $5^2 + 12^2 = 13^2$

   yes   No   yes   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?

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

   $x^2 + 324 = 841$

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

   $x = 22.7\,ft.$

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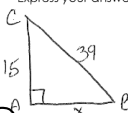
   $6^2 + 8^2 = x^2$

   $100 = x^2$

   $10 = x$ 10 miles

4. In a right triangle with acute angles C and B, the value of $sin(B) = \frac{15}{39} \frac{opp}{hyp}$. Find the value of $sin(C)$.

   Express your answer as a fraction in lowest terms.
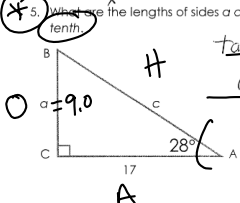
   $15^2 + x^2 = 39^2$

   $225 + x^2 = 1521$

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

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

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

   $tan\,28° = \frac{a}{17}$ SOH CAH TOA

   $a = 17\,tan\,28° = 9.0$

   $a = 9.0$

   $\frac{cos\,28°}{1} = \frac{17}{c}$

 $c \cdot cos\,28° = 17$

   $c = \frac{17}{cos\,28°} = 19.3$

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.
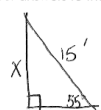
$$\sin 55° = \frac{X}{15}$$

$$X = 15 \sin 55° = 12.3 \, ft$$

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?
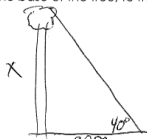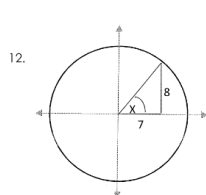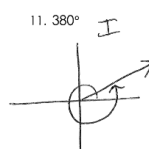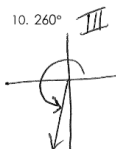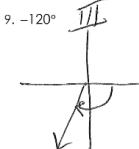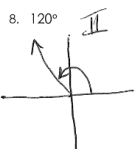
$$\tan 40° = \frac{X}{30}$$

$$X = 30 \tan 40° = 25.2 \, m$$

For the following angles:

    a. Sketch the angle on standard position
    b. Determine which quadrant the angle terminates in
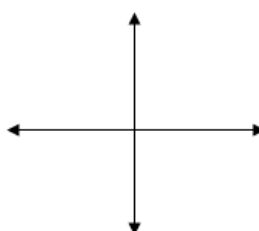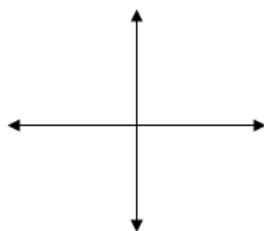
8. 120° II   9. −120° III   10. 260° III   11. 380° I

12.

Find m<X.

$$\tan X = \frac{8}{7}$$

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

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

Aug 8-9:06 PM

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

Aug 8-9:07 PM

Co-terminal Angles: angles that share the same $initial\ and\ terminal\ sides$
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:
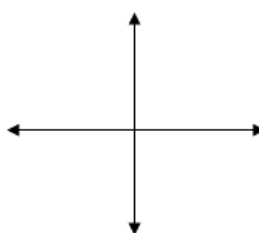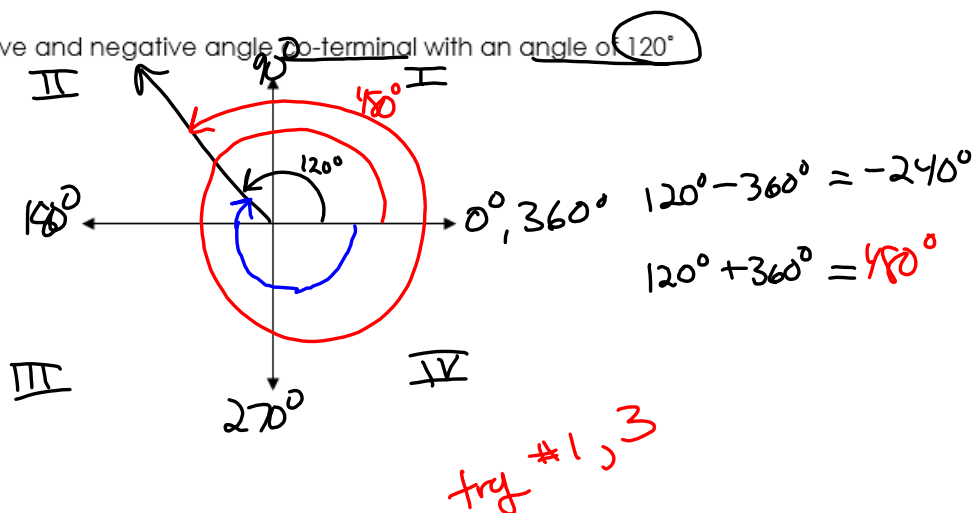
70°

−290°
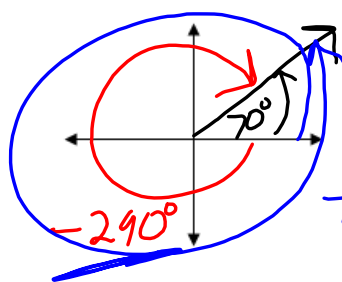
$70° + 360°$
$430°$

360°

$70 - 360 = -290°$
$70 + 360 = 430°$

Aug 8-9:07 PM

3

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

II   I

450°

120°

180°   0°, 360° $120° - 360° = -240°$

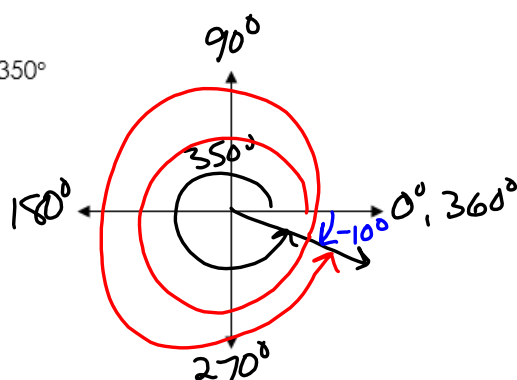$120° + 360° = 450°$

III   IV

270°

try #1, 3

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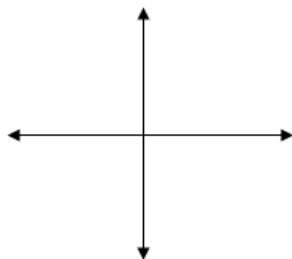   b. Find the measures of a positive and negative angle that are coterminal with the given angle.

1. 350°

90°

350°

180°   0°, 360°

x-10°

270°

a) IV

b) $350° + 360° = 710°$
   $350° - 360° = -10°$

4

2. 260°

3. -70°

a) IV b) $-70 - 360 = -430°$

$-70 + 360 = 290°$

290°

$-70°$

$-430°$

0°

Aug 8-9:07 PM

2. 260°

260°

270°

III

$620°$
$-100°$

3. -70°   ⓐ

$-70°$

IV
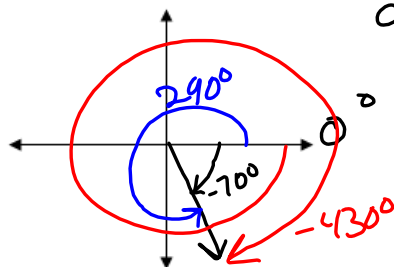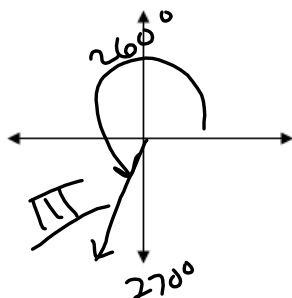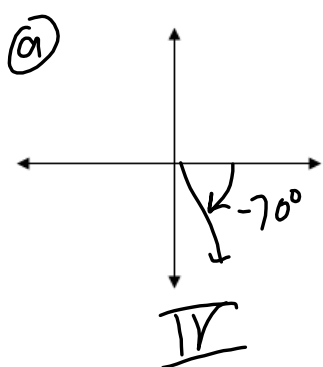
b) $-70° + 360° = 290°$

$-70 - 360° = -430°$

Aug 8-9:07 PM

5

theta

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.
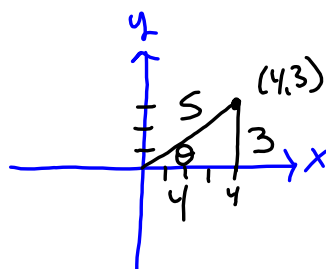
$$SOH \quad CAH \quad TOA$$

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

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

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

$$m\angle\theta = \sin^{-1}\left(\tfrac{3}{5}\right) = 36.8698$$
$$\approx 36.9°$$

(4,3)

3-4-5
$$3^2 + 4^2 = c^2$$
$$c^2 = 25$$
$$c = 5$$

Aug 8-9:08 PM

Quadrantal Angles and the Unit Circle

Quadrantal Angles
   Def: Angles whose terminal side is on the X or y axes

90°

0°
360°

180°

270°

Aug 8-9:08 PM

Unit Circle → Circle w/

radius = 1

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

$$\cos(\theta) = \frac{A}{H} = \frac{x}{1} = x$$
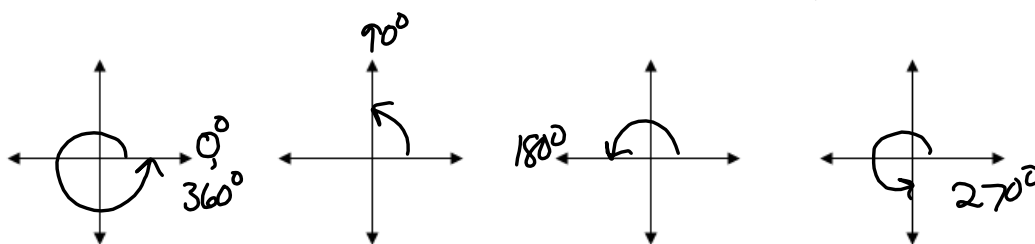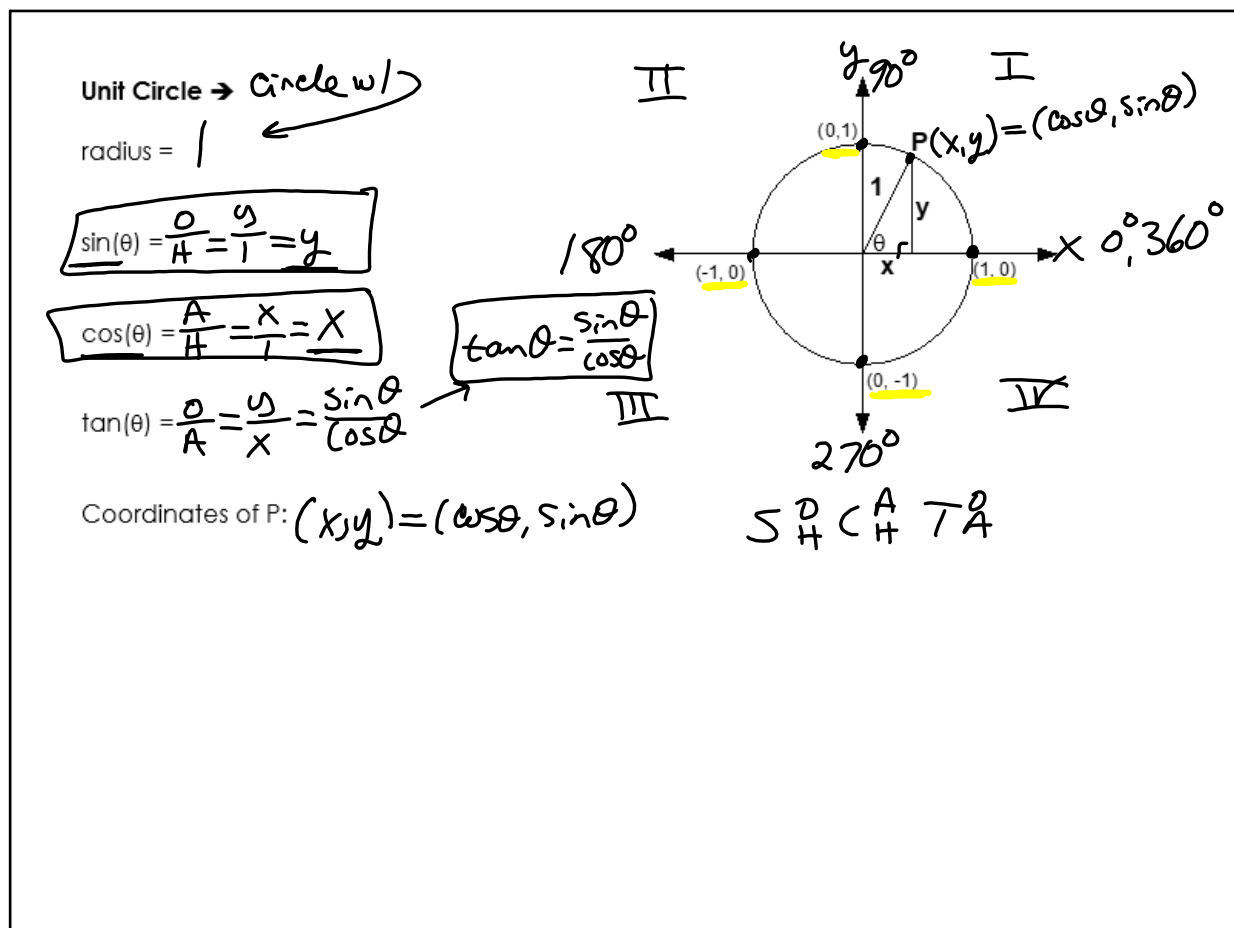
$$\tan(\theta) = \frac{O}{A} = \frac{y}{x} = \frac{\sin\theta}{\cos\theta}$$

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

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

II   I

y 90°

(0,1)   P(x,y) = (cosθ, sinθ)

1   y

θ   r

180°   (-1, 0)   x   (1, 0)   x   0°, 360°

(0, -1)

III   IV

270°

$$S\frac{O}{H} \quad C\frac{A}{H} \quad T\frac{O}{A}$$

Aug 8-9:08 PM

(cosθ, sinθ)

Sine, Cosine and Tangent of Quadrantals:

(1,0)   (0,1)   (-1,0)   (0,-1)   (1,0)

y
x

Degrees	0°	90°	180°	270°	360°
Radians					
sin(θ)	0	1	0	-1	0
cos(θ)	1	0	-1	0	1
tan(θ)	$\frac{0}{1}=0$	und	0	und	0

** Tomorrow we will fill in the Radians row.

(0,1)   P

1   y

θ   x

(-1, 0)   (1, 0)

(0, -1)

Aug 8-9:08 PM

7

Dec 12-3:35 PM