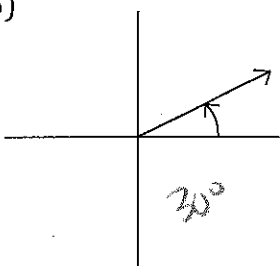Name: __KEY__

Which quadrant does the terminal side of each angle lie when it is in standard position?

1) 95°   2) -40°   3) 210°   4) -350°

    II   IV   III   I

For each angle shown in standard position, estimate the degree measure:

5)   6)   7)   8)

30°   -135°   450°   120°

Name two angles, one positive and one negative, that are coterminal with the given angle:

9) 40°   10) 183°

    400°   543°
    -320°   -177°

Express the angle measure in degrees, minutes, and seconds to the nearest second:

11) -313.53°

    -313°31'48"
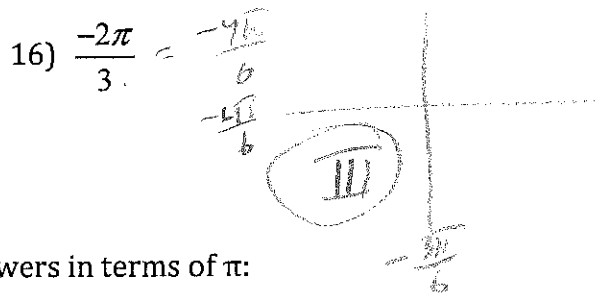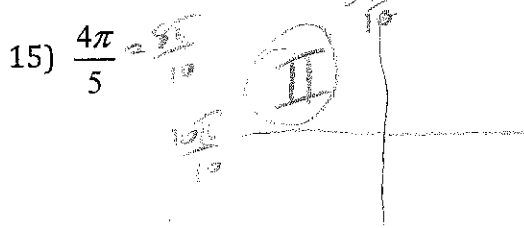
Express the angle measure in decimal degrees, to the nearest HUNDRETH of a degree:

12) 315°48'03"

     315.80°

For each of the following angles, find a coterminal angle with a measure between 0° and 360°:

13) 820°   14) -3610°

    100°   350°

In which quadrant does the terminal side of each angle lie when it is in standard position?

15) $\dfrac{4\pi}{5}$ = $\dfrac{8\pi}{10}$ *(handwritten work, circled II)*

16) $\dfrac{-2\pi}{3}$ = $\dfrac{-4\pi}{6}$, $\dfrac{-4\pi}{6}$ *(circled III)*

Express each angle measure in radians. Give answers in terms of π:

17) 120° $120 \cdot \dfrac{\pi}{180}$ = $\boxed{\dfrac{2\pi}{3}}$

18) 54° $54 \cdot \dfrac{\pi}{180}$ = $\boxed{\dfrac{3\pi}{10}}$

Express each angle measure in degrees:

19) $\dfrac{5\pi}{12}$ $\dfrac{5\pi}{12} \cdot \dfrac{180}{\pi}$ $\boxed{75°}$

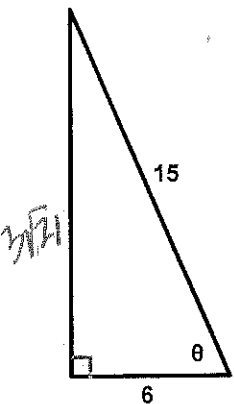20) $\dfrac{-13\pi}{18}$ $\dfrac{-13\pi}{18} \cdot \dfrac{180}{\pi}$ = $\boxed{-130°}$

Find two coterminal angles, one positive and one negative, for the given angle. Stay in radians!

21) $\dfrac{\pi}{3}$ $\dfrac{\pi}{3} - \dfrac{6\pi}{3}$ = $\boxed{-\dfrac{5\pi}{3}}$

$\dfrac{\pi}{3} + \dfrac{6\pi}{3}$ = $\boxed{\dfrac{7\pi}{3}}$

22) Find the exact values of the 6 trigonometric functions using the triangle below.

$\sin \theta = \dfrac{3\sqrt{21}}{15} = \dfrac{\sqrt{21}}{5}$ $\cos \theta = \dfrac{6}{15} = \dfrac{2}{5}$

$\tan \theta = \dfrac{3\sqrt{21}}{6} = \dfrac{\sqrt{21}}{2}$ $\cot \theta = \dfrac{2}{\sqrt{21}} = \dfrac{2\sqrt{21}}{21}$

$\sec \theta = \dfrac{5}{2}$ $\csc \theta = \dfrac{5}{\sqrt{21}} = \dfrac{5\sqrt{21}}{21}$

$b = \sqrt{225-36} = \sqrt{189} = 3\sqrt{21}$

(triangle with legs 15, 6 and $3\sqrt{21}$, angle θ)

Name: _____

NO CALCULATOR!- Evaluate the trigonometric function (it may help to draw a triangle):

23) $\sin 60° = \dfrac{\sqrt{3}}{2}$ $\cos 45° = \dfrac{1}{\sqrt{2}} = \dfrac{\sqrt{2}}{2}$ $\tan 30° = \dfrac{1}{\sqrt{3}} = \dfrac{\sqrt{3}}{3}$

$\csc 60° = \dfrac{2}{\sqrt{3}} = \dfrac{2\sqrt{3}}{3}$ $\sec 45° = \dfrac{\sqrt{2}}{1} = \sqrt{2}$ $\cot 30° = \dfrac{\sqrt{3}}{1} = \sqrt{3}$

$\dfrac{1}{\sin} = \dfrac{H}{O}$ $\dfrac{1}{\cos} = \dfrac{H}{A}$ $\dfrac{1}{\tan} = \dfrac{A}{O}$

NO CALCULATOR!- Find the value of θ in **degrees and radians** from the given information.

24) a) $\tan \theta = \sqrt{3}$ b) $\cos \theta = \dfrac{\sqrt{3}}{2}$ c) $\sec \theta = \dfrac{2\sqrt{3}}{3}$
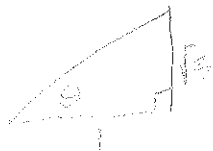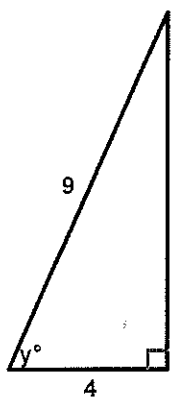
$\theta = 60°$ $\theta = 30°$ $\dfrac{1}{\cos} = \dfrac{H}{A}$ $\theta = 30°$

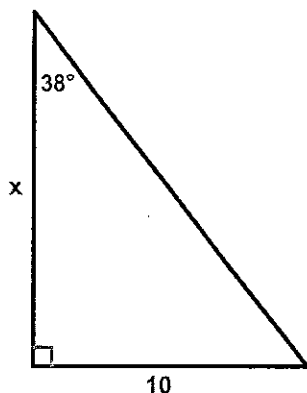25) Solve for y. Be sure to show your trig function and how you are solving.

$y = \underline{63.61°}$

$\cos y° = \dfrac{4}{9}$

$y° = \cos^{-1}\left(\dfrac{4}{9}\right) \approx 63.61°$

26. Solve for x. Be sure to show all work!
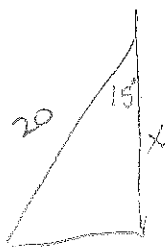
$$\tan 38° = \frac{10}{x}$$

$$x = \frac{10}{\tan 38°} \approx 12.80$$

x = __12.80__

27) A ladder that is 20 feet long is leaning against a wall. The ladder makes an angle of 15° with the wall. Find how far up the wall the ladder is resting.
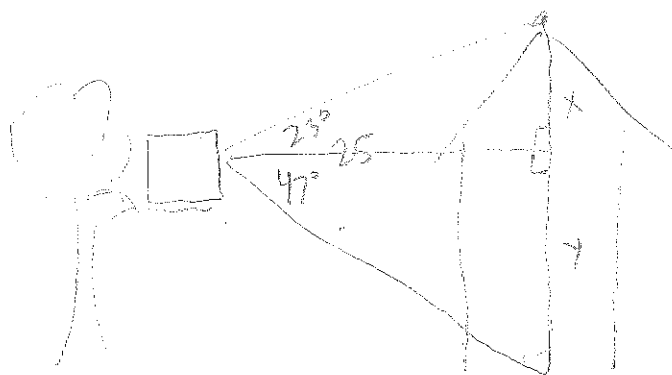
$$\cos 15° = \frac{x}{20}$$

$$x = 20(\cos 15°)$$

$$x \approx 19.32 \text{ ft}$$

28) Brady sits in his treehouse. He can look up at the roof of his house, but also look down at the door of the house. He has an angle of elevation to look up to the roof of 23°, and an angle of depression to look down at the door of 47°. If the base of the tree in which the treehouse sits is 25 feet from the house, how tall is Brady's house?

$$\tan 23° = \frac{x}{25}$$

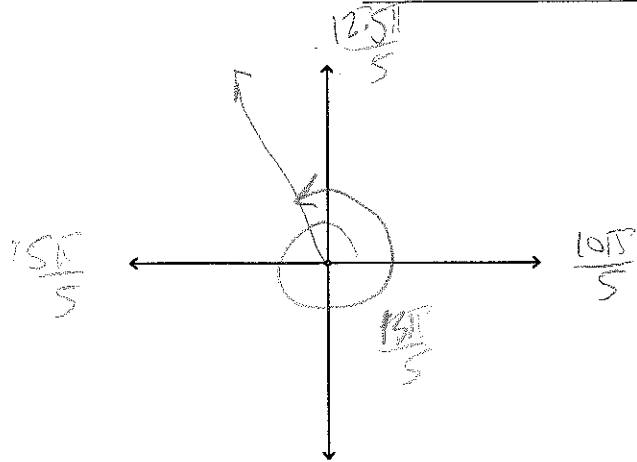$$x = 25 \tan 23° \approx 10.61$$

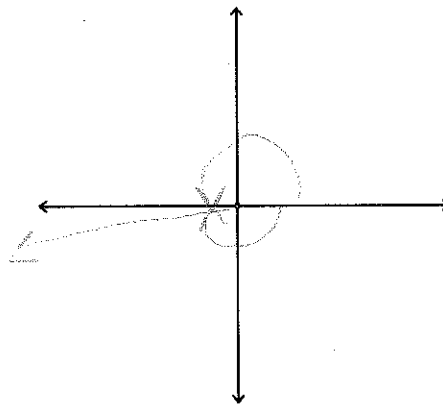$$\tan 47° = \frac{y}{25}$$

$$y = 25 \tan 47° \approx 26.81$$

$$x + y \approx 37.42 \text{ ft}$$

Name: _____

29) Sketch $\dfrac{13\pi}{5}$ in standard position.

$\dfrac{12.5\pi}{5}$

$\dfrac{15\pi}{5}$

$\dfrac{10\pi}{5}$

$\dfrac{13\pi}{5}$

30) Find a positive coterminal angle for $\theta = -178°$. Sketch both angles in standard position.
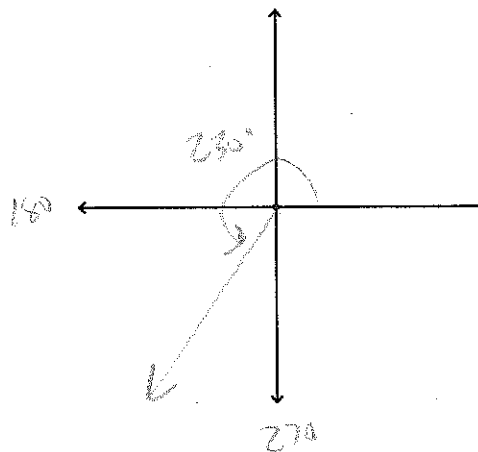
$-178 + 360 = 182°$

31) Sketch 230° in standard position. Find two more negative angles that are coterminal with 230°.

$230 - 360 = -130°$

$-130 - 360 = -490°$

230°

180

270

32. A carousel with an 18 yard diameter makes 6 revolutions per minute. Find the angular speed of the carousel in radians per minute, and the linear speed of the platform rim. Be sure to include units!

$$\text{(angular) } \omega = \frac{\theta}{t} = \frac{12\pi}{1} = \boxed{12\pi \text{ radians/min}}$$

$$1 \text{ rev} = 2\pi$$
$$6 \text{ rev} = 12\pi = \theta$$

$$\text{(linear) } v = \frac{s}{t} = \frac{r\theta}{t} = \frac{9(12\pi)}{1} = \boxed{108\pi \text{ yds/min}}$$

33. A pie has a diameter of 8 inches. You are planning to eat a piece with a central angle of 85°, and want to know the area of your piece. Find it! Leave your answer in terms of π. (how appropriate!)

$$85° \cdot \frac{\pi}{180°} = \frac{17\pi}{36} \text{ radians} \qquad r = 4 \text{ in}$$

$$A = \frac{1}{2}r^2\theta = \frac{1}{2}(4)^2 \frac{17\pi}{36} = \frac{1}{2}(16)\frac{17\pi}{36} = \boxed{\frac{34\pi}{9} \text{ in}^2}$$

arc length

34. A piece of pizza from has a crust with length 5 in. If the original pizza had a 16 inch diameter, what is the central angle of your piece in both radians and degrees? Round to one decimal place.

$$s = r\theta$$
$$5 \text{ in} = (8)\theta$$
$$\boxed{\theta = \frac{5}{8} \text{ radians}}$$

$$\frac{5}{2\pi} \cdot \frac{180°}{\pi} = \frac{225}{2\pi} \approx \boxed{35.81°}$$

Studying recommendations:
- Finish this review and check your answers against my answer key online.
- Come for help on Monday after school
- Do some more odd problems from sections 4.1 and 4.3 in the book.