Homework 7-2

1. -285°, 435° 2. -395°, 325°

3. -490°, 230° 4. 90°, -630°

5. unit circle, $\cos(\theta)$, $\sin(\theta)$

6. 0 7. -1 8. 0 9. 1

10. 90^{o}, 270^{o} 11. 0^{o} 12. 0^{o}, 180^{o}

13. 90^{o}, 270^{o} 14. 270^{o} 15. 0^{o}, 180^{o}

16. $\sin(\theta) = 12/13$ $\cos(\theta) = 5/13$

17. $\cos(\theta) = -12/13$

Name: Key

Period :

Algebra 2 Homework 7-2

1 – 4: Sketch the following angles and name one positive and one negative co-terminal angle.

1. 75°

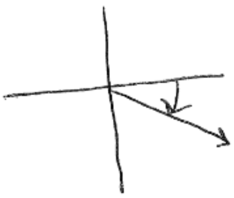
$75 + 360° = 435°$

$75 - 360° = -285°$

2. –35°

$-35 + 360 = 325°$

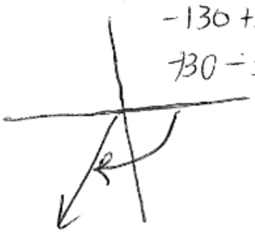
$-35 - 360 = -395°$



3. –130°

$-130 + 360 = 230°$

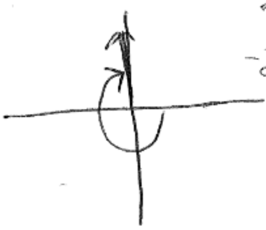
$-130 - 360 = -490°$



4. –270°

$-270 + 360 = 90°$

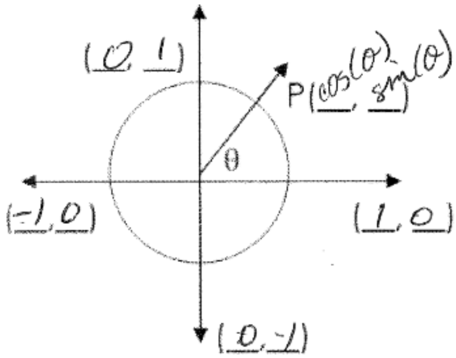
$-270 - 360 = -630°$



5. **Fill in the blanks:** On the unit circle, the x - coordinate of a point is equal to cos(θ) and the y - coordinate is equal to sin(θ)

6 – 9: Fill in the unit circle. Using the unit circle, determine the following:

6. cos (90°) = 0
7. sin (270°) = -1
8. tan (180°) = 0
9. cos (0°) = 1



10 - 15: Using the unit circle, find all of the measure of angle θ. $0° \le \theta < 360°$

10. $\cos(\theta) = 0$ (means what angle(s) has a cosine = 0?) $90°, 270°$

11. $\cos(\theta) = 1$ $0°$

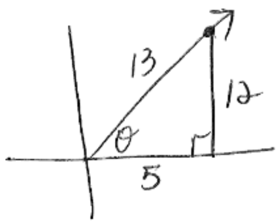
12. $\tan(\theta) = 0$ $0°, 180°$

13. $\tan(\theta) =$ undefined $90°, 270°$

14. $\sin(\theta) = -1$ $270°$

15. $\sin(\theta) = 0$ $0°, 180°$

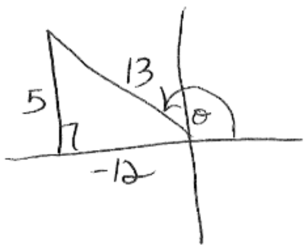
16. The terminal side of $\measuredangle\theta$ passes through the point (5, 12). What are the sine and cosine of θ?



$\cos(\theta) = \frac{5}{13}$

$\sin(\theta) = \frac{12}{13}$

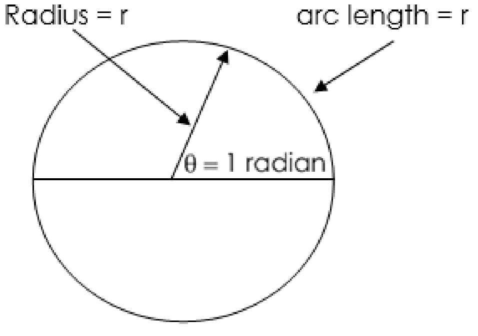
17. The terminal side of $\measuredangle\theta$ passes through the point (-12, 5). What is $\cos(\theta)$?



$\cos(\theta) = \frac{-12}{13}$

Day 3: Radian Measure

Def: A **radian** is the measure of an angle, whose vertex is the center of the circle, and intercepts an arc equal in length to the radius of the circle.



The circle has a radius r. The angle is the angle formed when we draw an arc exactly r in length around the outer portion of the circle. Thus, the arc is exactly one radius in distance and the angle is exactly one radian in measure.

Let's make the radius of the above circle equal to 1. This makes the circle the unit circle. Now let's determine how many radians are in a circle.

Circumference = πd or $2\pi r$
r = 1
So the circumference = 2π radians

We know that ______° are in a circle. So let's use this to determine how much a radian is in degrees.

$360° = \underline{2\pi}$ radians

$180° = \pi$ radians

How many degrees in one radian?

$$\frac{x}{360} = \frac{1}{2\pi}$$

$$\frac{2\pi x}{2\pi} = \frac{360}{(2\pi)}$$

$$x = 57° = 1 \text{ rad.}$$

How many radians in one degree?

$$\frac{1}{360} = \frac{x}{2\pi}$$

$$\frac{360x}{360} = \frac{\cancel{2}\pi}{\cancel{360}\,180}$$

$$x = \frac{\pi}{180} \text{ radians } = 1°$$

To convert from degrees to radians: degrees x $\frac{\pi}{180^\circ}$

Example: To convert 30° to radians - > $\cancel{30^\circ} \times \frac{\pi}{\underset{6}{\cancel{180^\circ}}} = \frac{\pi}{6}$

While there are certain angles we will use frequently in this course, such as 30°, 45°, 60°, 90°, etc., they have straightforward fractional equivalents in radians.

Convert the following to radians. Give answers in terms of π and rounded to nearest tenth.

1. 45° $\left(\frac{\pi}{180}\right) = \frac{45\pi}{180} = \frac{\pi}{4}$
2. -60° $\left(\frac{\pi}{180}\right) = \frac{-60\pi}{180} = \frac{-\pi}{3}$
3. 90° $\left(\frac{\pi}{180}\right) = \frac{\pi}{2}$
4. - 120° $\left(\frac{\pi}{180}\right) = \frac{-120\pi}{180} = \frac{-2\pi}{3}$
5. 75° $\left(\frac{\pi}{180}\right) = \frac{75\pi}{180} = \frac{5\pi}{12}$
6. Go back to yesterday's chart and convert the quadrantals to radians

Sine, Cosine and Tangent of Quadrantals:

Degrees	0°	90°	180°	270°	360°
Radians					

To convert from radians to degrees: radians x $\frac{180^\circ}{\pi}$

Example: To convert $\frac{7\pi}{6}$ to degrees - > $\frac{7\cancel{\pi}}{6} \bullet \frac{180^\circ}{\cancel{\pi}} = 210^\circ$ $7(180)/6$

Now you try. Convert the following radians to degrees.

1. $\frac{11\cancel{\pi}}{6}\left(\frac{180^\circ}{\cancel{\pi}}\right) = \frac{11(180)}{6} = 330^\circ$

2. $\frac{5\cancel{\pi}}{4}\left(\frac{180}{\cancel{\pi}}\right) = \frac{5(180)}{4} = 225^\circ$

3. $\frac{3\cancel{\pi}}{4}\left(\frac{180}{\cancel{\pi}}\right) = \frac{3(180)}{4} = 135^\circ$

4. $\frac{5\cancel{\pi}}{6}\left(\frac{180}{\cancel{\pi}}\right) = \frac{5(180)}{6} = 150^\circ$

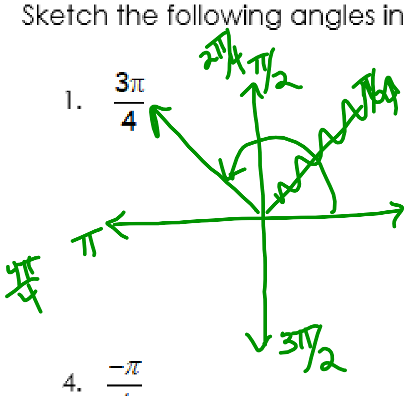
5. $2.7\left(\frac{180}{\pi}\right) = \frac{2.7(180)}{\pi} = 154.7^\circ$

*** A quick trick for converting from radians to degrees:**
If there is a π in the angle measurement, then replace the π with 180°.
Try this! Recalculate #1 and 2 using this trick.

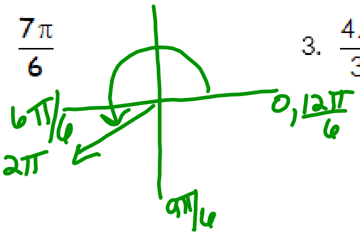
1) $\frac{11(180)}{6} = 330^\circ$ 2) $\frac{5(180)}{4} = 225^\circ$

Sketch the following angles in standard positon.

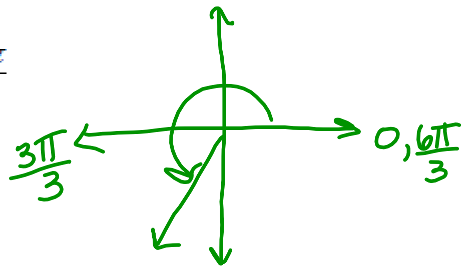
1. $\frac{3\pi}{4}$



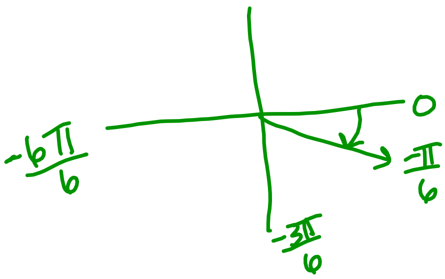
2. $\frac{7\pi}{6}$



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

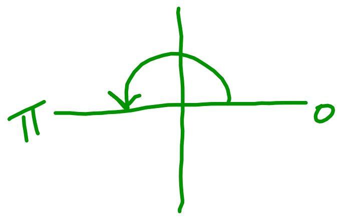


4. $\frac{-\pi}{6}$



5. 3.14 radians

π rad



6. 1.57 radians

7. Regents Question (2016):

Which diagram shows an angle rotation of 1 radian on the unit circle?