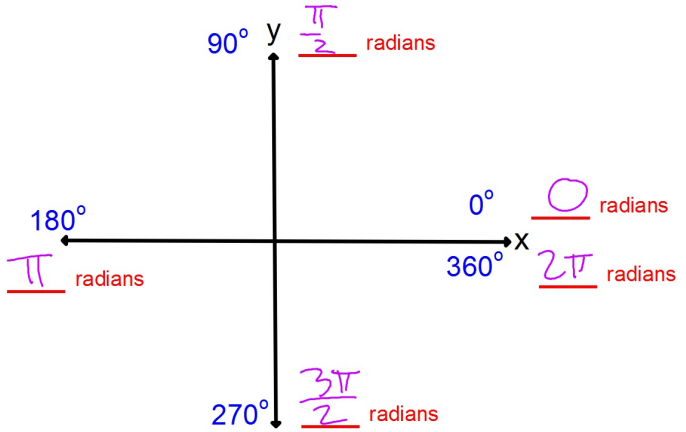
Since one full turn around a circle is measured as 360° AND 2π radians this means $360° = 2\pi$

To convert between degrees and radians you can use one of the following conversion factors:

$$\frac{\pi}{180°} \quad or \quad \frac{180°}{\pi}$$

Radian measure at each axis.



When dealing with degrees Coterminal angles are found by adding and/or subtracting 360° as many times as you want to or need to in order to answer the question.

When dealing with radians Coterminal angles are found by adding and/or subtracting 2π as many times as you want to or need to in order to answer the question.
To add or subtract 2π you'll need to get a common denominator. The number 2 is any fraction where the numerator is twice the denominator. Since you'll already know what the denominator needs to be by the given angle just double it to create the numerator.

for example $\frac{17\pi}{3} + 2\pi$

2π must be turned into the following fraction $\frac{6\pi}{3}$

Denominator must be 3 which makes the numerator 6π in order to be equivalent to 2π

$$= \frac{17\pi}{3} + \frac{6\pi}{3} = \frac{23\pi}{3}$$

Find a positive and a negative coterminal angle for each given angle. Give each answer in radians and in terms of π. Reduce fractions.

1. $\theta = \frac{9\pi}{4}$

$2\pi = \frac{8\pi}{4}$

Pos: $\frac{9\pi}{4} - \frac{8\pi}{4} = \frac{\pi}{4}$

Neg: $\frac{\pi}{4} - \frac{8\pi}{4} = \frac{-7\pi}{4}$

2. $\theta = -\frac{13\pi}{6}$

$2\pi = \frac{12\pi}{6}$

Pos: $-\frac{\pi}{6} + \frac{12\pi}{6} = \frac{11\pi}{6}$

Neg: $-\frac{13\pi}{6} + \frac{12\pi}{6} = -\frac{\pi}{6}$

Find a positive and a negative coterminal angle for each given angle. Give each answer in radians and in terms of π. Reduce fractions.

3. $\theta = \frac{38\pi}{3}$ $2\pi = \frac{6\pi}{3}$

Pos: $\frac{32\pi}{3}$, $\frac{44\pi}{3}$

Neg: $-\frac{4\pi}{3}$

4. $\theta = \frac{158\pi}{37}$ $2\pi = \frac{74\pi}{37}$

Pos: $\frac{232\pi}{37}$ $\frac{84\pi}{37}$

Neg: $-\frac{64\pi}{37}$

Find the measure of an angle between 0 and 2π that is coterminal to the given angle.

1. $\theta = \frac{32\pi}{7}$ $2\pi = \frac{14\pi}{7}$

a. $\frac{32\pi}{7} - \frac{14\pi}{7} = \frac{18\pi}{7}$

b. $\frac{18\pi}{7} - \frac{14\pi}{7} = \frac{4\pi}{7}$

2. $\theta = -\frac{27\pi}{4}$ $2\pi = \frac{8\pi}{4}$

a. $-\frac{27\pi}{4} + \frac{8\pi}{4} = -\frac{19\pi}{4}$

b. $-\frac{19\pi}{4} + \frac{8\pi}{4} = -\frac{11\pi}{4}$

c. $-\frac{11\pi}{4} + \frac{8\pi}{4} = -\frac{3\pi}{4}$

d. $-3\pi/4 + 8\pi/4 = 5\pi/4$

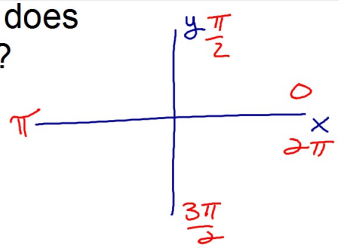
3. $\theta = \frac{41\pi}{6}$ $2\pi = \frac{12\pi}{6}$

a. $\frac{41\pi}{6} - \frac{12\pi}{6} = \frac{29\pi}{6}$

b. $\frac{29\pi}{6} - \frac{12\pi}{6} = \frac{17\pi}{6}$

c. $\frac{17\pi}{6} - \frac{12\pi}{6} = \frac{5\pi}{6}$

In which quadrant or on which axis does the terminal angle of each angle lie?



1. $\theta = -\frac{23\pi}{8}$ $2\pi = \frac{16\pi}{8}$

a. $-\frac{23}{8}\pi + \frac{16}{8}\pi = -\frac{7\pi}{8}$

b. $-\frac{7\pi}{8} + \frac{16\pi}{8} = \frac{9\pi}{8}$

$\frac{9\pi}{8}$ is between π & $3\pi/2$ → Quad III

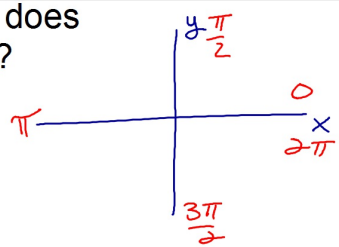
2. $\theta = \frac{11\pi}{2}$ $2\pi = \frac{4\pi}{2}$

a. $\frac{11\pi}{2} - \frac{4\pi}{2} = \frac{7\pi}{2}$

b. $\frac{7\pi}{2} - \frac{4\pi}{2} = \frac{3\pi}{2}$ → Neg y-axis

Any reduced radian measure that has a denominator of 2 will always be on either positive or the negative y-axis.

In which quadrant or on which axis does the terminal angle of each angle lie?



3. $\theta = 37\pi$ $-16(2\pi) = \pi$

Neg x-axis

Any even multiple of π will always be on the positive x-axis and any odd multiple of π will always be on the negative x-axis.

4. $\theta = \frac{43\pi}{6}$ $2\pi = \frac{12\pi}{6}$

a. $\frac{43\pi}{6} - \frac{12\pi}{6} = \frac{31\pi}{6}$

b. $\frac{31\pi}{6} - \frac{12\pi}{6} = \frac{19\pi}{6}$

c. $\frac{19\pi}{6} - \frac{12\pi}{6} = \frac{7\pi}{6}$ → $\frac{7\pi}{6}$ is between π & $3\pi/2$ → Quad III

You can now finish Hwk #16:

Practice Sheet: Radians

Due Tomorrow for 1st to 3rd hrs

Due Thursday for 4th and 6th hrs