

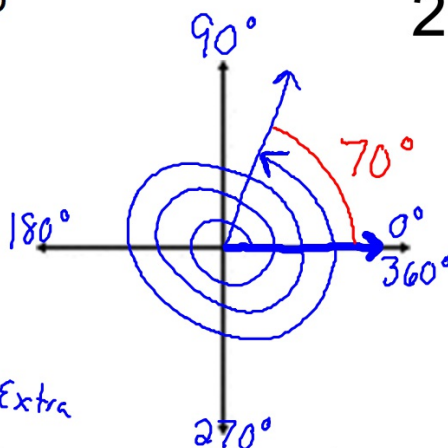
Bellwork

Graph the given angles in standard position:

1. 1150°

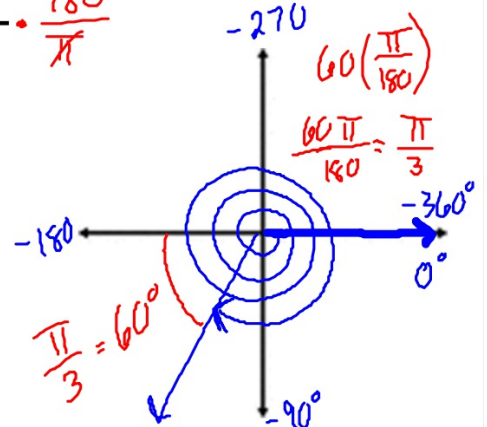
$$\begin{array}{r} -360 \\ 790^\circ \\ -360^\circ \\ \hline 430^\circ \\ -360^\circ \\ \hline 70^\circ \end{array}$$

3 Rot. + 70° Extra



2. $\frac{20\pi}{3} \cdot \frac{180}{\pi}$

$$\begin{array}{r} -1200^\circ \\ +360 \\ \hline -840^\circ \\ +360^\circ \\ \hline -480^\circ \\ +360 \\ \hline -120^\circ \end{array}$$



Identify how many degrees are between the terminal side and the closest x-axis for each of the above angles.

Review of Vital Concepts

Direction of Rotation:

Positive - Counter Clockwise

Negative - Clockwise

Starting Point:

Place your pencil on the initial side and rotate in the appropriate direction.

Changing Radians to Degrees:

Multiply by $\frac{180}{\pi}$

Reference Angles

Definition:

The smallest angle between the terminal side and the x-axis.

Usefulness:

The values of the trigonometric functions are the same as the trigonometric values for the reference angles; give or take a minus sign.

Finding Reference Angles

Procedure:

1. Graph the given angle in standard position.
2. Draw a line connecting the terminal side to the x-axis:
 - A. Terminal side in QI or QII
Then draw a line going down.
 - B. Terminal side in QIII or QIV
Then draw a line going up.
3. Find the measure of the angle between the x-axis and the terminal side.

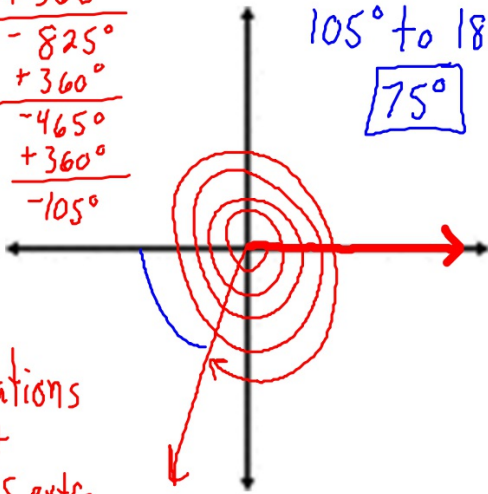
Examples

Find the Reference Angle of each of the given angles:

1. -1545°

$$\begin{array}{r} + 360^\circ \\ -1185^\circ \\ + 360 \\ - 825^\circ \\ + 360^\circ \\ - 465^\circ \\ + 360^\circ \\ - 105^\circ \end{array}$$

Reference Angle:
 105° to $180^\circ =$
 75°

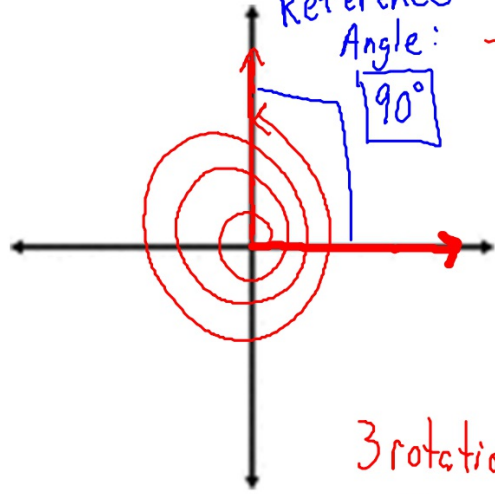


4 rotations
 +
 -105 extra

2. $\frac{13\pi}{2} - \frac{4\pi}{2} = \frac{9\pi}{2} - \frac{4\pi}{2} = \frac{5\pi}{2}$

$$- \frac{4\pi}{2} \\ \frac{\pi}{2}$$

Reference Angle:
 90°



3 rotations
 + $\frac{\pi}{2}$