

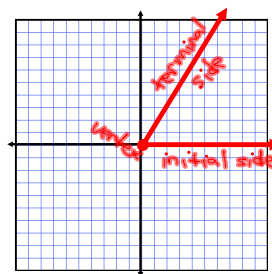
Algebra II

12-1

Angles and Degree Measure

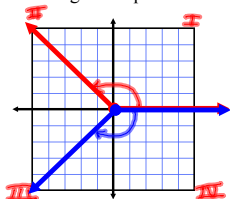
Angles in the Standard Position - initial side must lie on the positive x-axis, vertex must lie on the origin.

Draw an angle in standard position and label its parts.



Sketch each angle in standard position. Indicate its rotation by a curved arrow. Classify each angle by its quadrant. If the angle is a quadrantal angle, say so.

- 1 a) 135° **II**
 b) -135° **III**

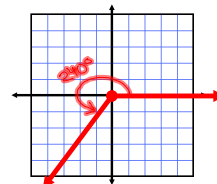


Quadrantal angle - angle whose terminal side is in between quadrants.

Sketch in standard position the angle described and then find its measure.

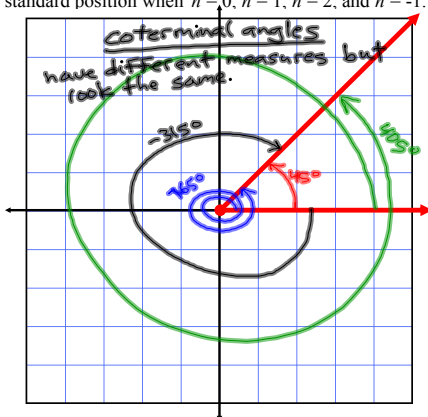
- 13) $\frac{2}{3}$ of a counterclockwise revolution

$$360^\circ \left(\frac{2}{3}\right) = 240^\circ$$



Sketch each angle in standard position when $n=0, n=1, n=2,$ and $n=-1$.

- 19) $45^\circ + 360^\circ \cdot n$
 $45^\circ + 360^\circ(0) = 45^\circ$
 $45^\circ + 360^\circ(1) = 405^\circ$
 $45^\circ + 360^\circ(2) = 765^\circ$
 $45^\circ + 360^\circ(-1) = -315^\circ$



For the following,

- a) Write a formula for the measures of all angles coterminal with the given angle.
 b) Use the formula to find two angles, one positive and one negative, that are coterminal with the given angle.

- 23) 35°

a) $35^\circ + 360^\circ n, n \in \mathbb{Z}$ *integers*

b) $35^\circ + 360^\circ(1) = 395^\circ$
 $35^\circ + 360^\circ(-1) = -325^\circ$

Express in degrees to the nearest tenth of a degree.

$$31) 15^{\circ}30' = 15.5^{\circ}$$

$$\frac{30}{60} = .5$$

divide the minutes part by 60 because there are 60 minutes in a degree.

Express in degrees and minutes to the nearest minute.

$$39) 25.4^{\circ} = 25^{\circ}24'$$

$$\begin{array}{r} 60 \\ \times .4 \\ \hline 24 \end{array}$$

multiply the decimal part by 60 because there are 60 minutes in a degree.

Express in degrees, minutes, and seconds to the nearest second.

$$43) 34.41^{\circ} = 34^{\circ}24.6' = 34^{\circ}24'36''$$

$$\begin{array}{r} .41 \\ \times 60 \\ \hline 24.60 \end{array}$$

multiply the decimal part by 60 because there are 60 minutes in a degree.

$$\begin{array}{r} .6 \\ \times 60 \\ \hline 36 \end{array}$$

then multiply the decimal part by 60 because there are 60 seconds in a minute.

Common Texas Instruments calculator shortcuts.

$$34.41 \text{ DD } \triangleright \text{ DMS}$$

$$34.41 \text{ [0'"] } \triangleright \text{ DMS}$$

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