You can generate any angle by using a rotation where one ray called the initial side is rotated until reaching another ray called the terminal side. If the initial side starts on the positive $x$-axis, the angle is said to be in standard position.

Positive angles are generated by counterclockwise rotations, while negative angles are produced by clockwise rotations.

Standard position angles:
If the terminal side lies on the $x$-axis or $y$-axis, the angle is called a **quadrantal angle**.

Two standard position angles are **coterminal** if their terminal sides coincide (are the same line).

The measures of all angles coterminal with $150^\circ$ are given by the formula: $150^\circ + n \cdot 360^\circ$, where $n$ is an integer.

Ex 1a) Write a formula for the measures of all angles coterminal with $30^\circ$.

**Solution 1a)** $30^\circ + n \cdot 360^\circ$
Ex 1b) Use the formula to find two positive angles and two negative angles that are coterminal with $30^\circ$.

Solution 1b) Let $n = -2, -1, 1,$ and $2$.

$30^\circ + (-2) \cdot 360^\circ = -690^\circ$

$30^\circ + (-1) \cdot 360^\circ = -330^\circ$

$30^\circ + (1) \cdot 360^\circ = 390^\circ$

$30^\circ + (2) \cdot 360^\circ = 750^\circ$

For greater accuracy, one degree ($1^\circ$) can be divided into 60 minutes ($60'$), or $1^\circ = 60'$.

One minute ($1'$) can be divided into 60 seconds ($60''$), or $1' = 60''$.

Use the following summary for degrees, minutes, and seconds:

$$1' = \left(\frac{1}{60}\right)^\circ$$

$$1'' = \left(\frac{1}{60}\right)' = \left(\frac{1}{3600}\right)^\circ$$
Ex 2a) Express $14^\circ 36' 54"$ in decimal degrees:

2a) $14^\circ 36' 54" =

\[
14^\circ 36' 54" = 14^\circ + \left(\frac{36}{60}\right)^\circ + \left(\frac{54}{3600}\right)^\circ
\]

= $14^\circ + 0.6^\circ + 0.015^\circ$
= $14.615^\circ$

Ex 2b) Express $72.568^\circ$ in degrees, minutes, and seconds rounded to the nearest second.

2b) $72.568^\circ = 72^\circ + (0.568 \times 60)'$
= $72^\circ + 34.08'$
= $72^\circ + 34' + (0.08 \times 60)''$
= $72^\circ + 34' + 4.8''$
= $72^\circ 34' 5''$