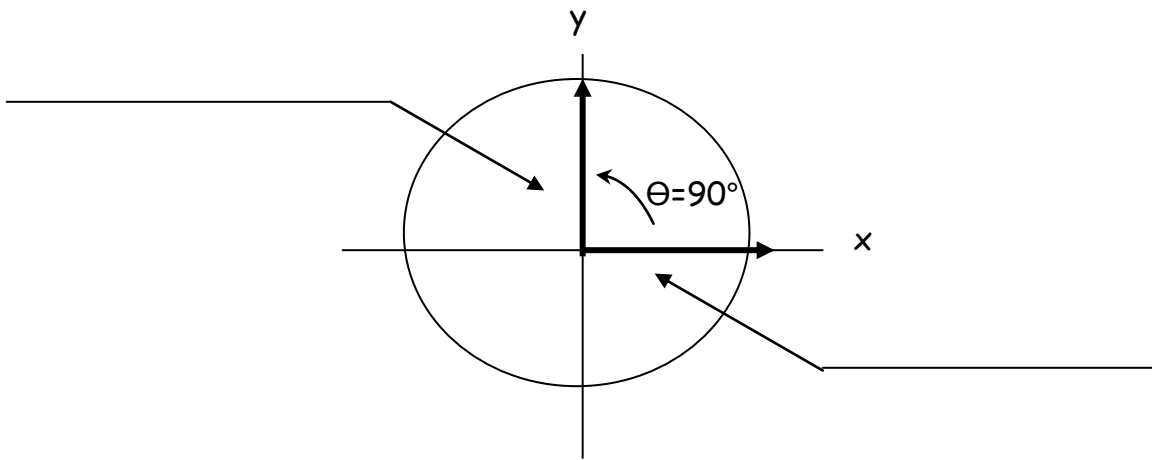


Standard Position and Coterminal Angles

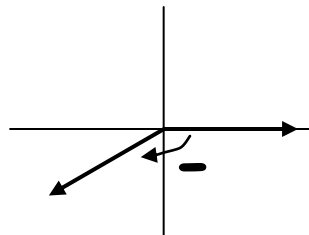
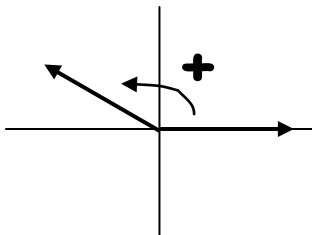
STANDARD POSITION is a common convention used to describe the size and orientation of angles. Every angle has an 'initial arm' and an 'terminal arm.' When using **STANDARD POSITION**, we represent the initial and terminal arms of an angle on a x-y axes system with the initial arm of the angle ALWAYS placed on the x-axis pointing right.

The start position can be represented by an 'initial arm' and the end position by a 'terminal arm.' A positive rotation from the initial to terminal arm is **COUNTER-CLOCKWISE**. Label the arms of the following 90° angle.



COTERMINAL ANGLES are angles whose terminal arms have the same standard position. The angles 180° , 540° , 900° , 1260° and 1620° are all coterminal angles because for each of these angles of rotation share a terminal arm with an angle between 0 and 360° .

An angle can be either positive or negative. If the terminal arm of an angle opens in a counter-clockwise direction, the angle is positive. If the terminal arm opens in a clock-wise direction, the angle is negative.



Examples:

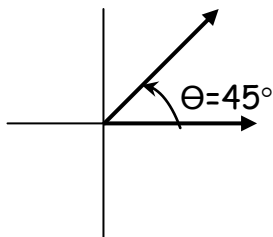
1. Draw the following angles in standard position. The first one has been done for you.

a) 45°

b) 120°

c) -45°

d) 420°



2. For each angle below, find one positive coterminal angle and one negative coterminal angle.

a) 30°

b) 310°

c) -90°

3. The terminal arm of an angle passes through the point $P(4, 3)$. Find the value of the angle if it is less than 90° .

4a) How many angles are coterminal with 30° . Why?

4b) Write an expression representing all the angles coterminal with 30° .