Right triangle trigonometry involves angles with the following measures:
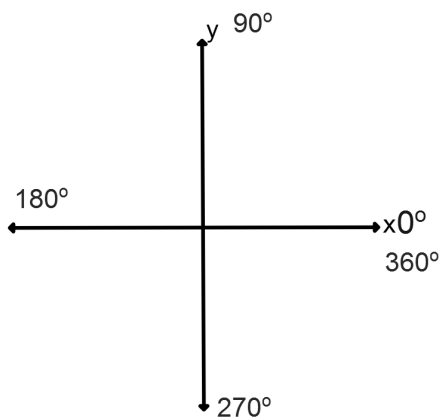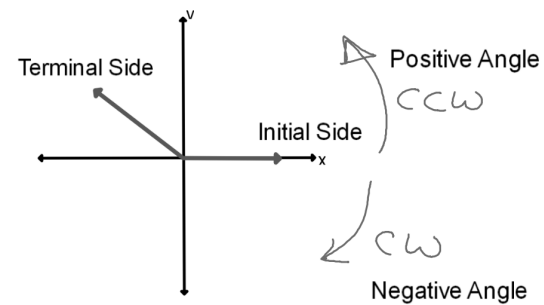
0°<θ<90°

and using     SOHCAHTOA

This means you were only able to find the Sin, Cos, and Tan of acute angles.
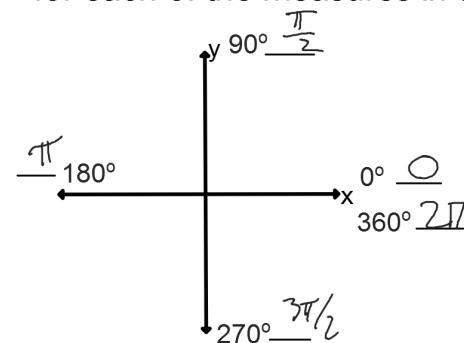
Angles in Standard Position:

Vertex is at the origin and one ray is on the positive x-axis.

Terminal Side

Initial Side

Positive Angle
CCW

CW
Negative Angle

90°

0° is the positive x-axis

180°

x0°
360°

270°

State the equivalent measure in radians for each of the measures in degrees shown below.

90° $\frac{\pi}{2}$

$\frac{\pi}{}$ 180°

0° $\bigcirc$
360° $2\pi$

270° $\frac{3\pi}{2}$

The terminal side is in the middle of the third quadrant.
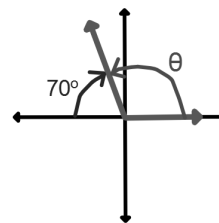Give two possible measures for this angle.

$\theta = 225°$   $\theta = -135°$

180+45
+225°

90° y

180°

x 0°
360°

-135°
-90-45

270°
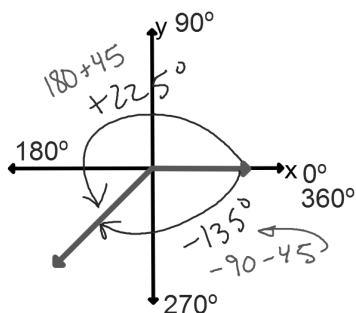
Can you give 2 more
possible measures
of this angle?

$\theta = 225° + 360°$
$= 585°$

$\theta =$
$-135° - 360°$
$= -495°$

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Find the measure of each angle in standard position.

1.

70°   θ

$\theta = 180° - 70°$
$= 110°$

2.

65°

θ
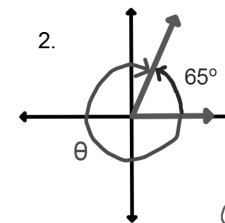
$65° - 360°$

$\theta = -295°$

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## Coterminal Angles: Angles in Standard Position
### that have the same terminal side.

They start and stop in the same spot but
aren't the same angle.   How could this be?

Terminal
Side

θ

+θ

-θ

Initial Side
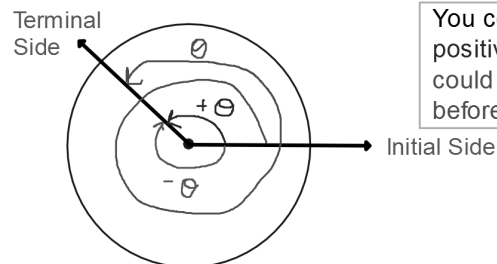
You could measure the angle in a
positive or Negative direction, or you
could keep turning around and around
before you stop at the terminal side.

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Find a positive and a negative coterminal angle for
each given angle.   You add/or subtract 360° as many times
as you want/need to.

1.  $\theta = 800°$          2.  $\theta = -70°$

Pos:
$800 + 360 = 1160°$

You could keep adding 360° to
get more possible answers or, in
this case,  subtract 360° once
or twice and still have a positive
coterminal angle.

Neg:
$800 - 360 = 440$
$440 - 360 = 80$
$80 - 360 = -280°$

Pos:   $-70° + 360 = 290°$

Neg:   $-70° - 360° = -430°$

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

You add/or subtract $2\pi$ as many times as you want/need to.

$$\theta = \frac{8\pi}{3}$$

$$2\pi = \frac{6\pi}{3}$$

Pos:

$$\frac{8\pi}{3} + \frac{6\pi}{3} = \boxed{\frac{14\pi}{3}}$$

Neg:

$$\frac{8\pi}{3} - \frac{6\pi}{3} = \boxed{\frac{2\pi}{3}}$$

$$\frac{2\pi}{3} - \frac{6\pi}{3} = \boxed{\frac{-4\pi}{3}}$$

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

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

Pos:

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

$$\boxed{\frac{11\pi}{6}}$$

Neg:

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