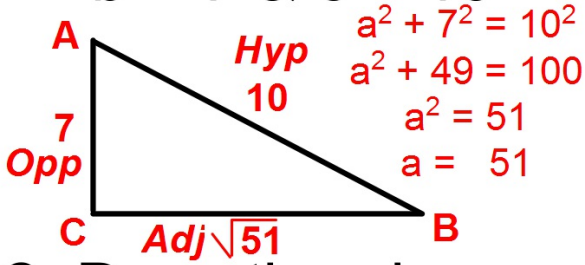
Bellwork

1. Evaluate the 6 trigonometric functions for the triangle using Angle B:

SOH-CAH-TOA

b = 7 & c = 10



$a^2 + 7^2 = 10^2$

$a^2 + 49 = 100$

$a^2 = 51$

$a = \sqrt{51}$

$\sin B = \frac{7}{10}$ $\quad \csc B = \frac{10}{7}$

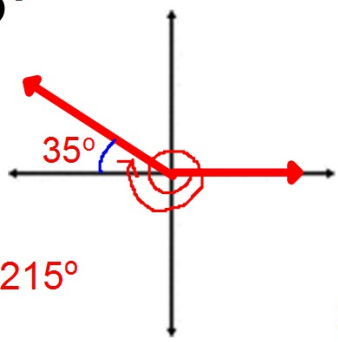
$\cos B = \frac{\sqrt{51}}{10}$ $\quad \sec B = \frac{10 \cdot \sqrt{51}}{\sqrt{51} \cdot \sqrt{51}} = \frac{10\sqrt{51}}{51}$

$\tan B = \frac{7 \cdot \sqrt{51}}{\sqrt{51} \cdot \sqrt{51}} = \frac{7\sqrt{51}}{51}$ $\quad \cot B = \frac{\sqrt{51}}{7}$

2. Draw the given angles in standard position:

A. -575°

$-575^\circ + 360^\circ = -215^\circ$

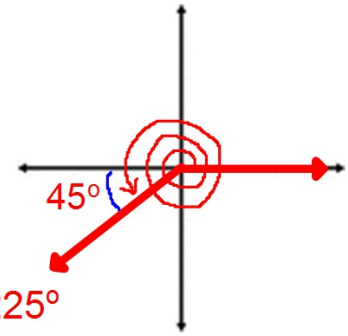


1 rotation and -215°

B. 945°

$945^\circ - 360^\circ = 585^\circ$

$585^\circ - 360^\circ = 225^\circ$



2 rotations and 225°

Coterminal Angles

Definition:

Two angles are coterminal if they are drawn in the standard position and both have their terminal sides in the same location.

Finding Coterminal Angles

Procedure:

1. Add 1 full rotation of the terminal side 360^{o} (Or 2π when in radians) at a time until you reach the desired conclusion.

OR

1. Subtract 1 full rotation of the terminal side 360^{o} (Or 2π when in radians) at a time until you reach the desired conclusion.

Examples

Find one (1) positive and one (1) negative coterminal angle of the given angle:

1. -948^o

Positive Coterminal:

$-948^o + 360^o = -588^o$

$-588^o + 360^o = -228^o$

$-228^o + 360^o = \boxed{132^o}$

You have to add 360^o until you reach a positive value.

Negative Coterminal:

$-948^o - 360^o = \boxed{-1308^o}$

OR

$-948^o + 360^o = \boxed{-588^o}$

$-588^o + 360^o = \boxed{-228^o}$

Any of these are okay as long as they are negative and not the original given angle.

2. 624^o

Positive Coterminal:

$624^o + 360^o = \boxed{984^o}$

OR

$624^o - 360^o = \boxed{264^o}$

Either of these is okay as long as they are positive and not the original given angle.

Negative Coterminal:

$624^o - 360^o = 264^o$

$264^o - 360^o = \boxed{-96^o}$

Sometimes you have to subtract 360^o until you reach a negative value.

Examples

Find one (1) positive and one (1) negative coterminal angle of the given angle:

3. $\frac{-14\pi}{3}$

Method 1: Add/Subtract 2

Positive Coterminal

$$\left(\frac{-14}{3}+2\right)\pi=\left(\frac{-8}{3}+2\right)\pi=\left(\frac{-2}{3}+2\right)\pi=\boxed{\frac{4\pi}{3}}$$

Negative Coterminals

Method 2: Convert to degrees and do as we did in Ex. 1 & 2. THEN, convert back to radians as it was given.

4. $\frac{28\pi}{5}$

Method 1: Add/Subtract 2

Positive Coterminal

$$\left(\frac{28}{5}-2\right)\pi=\boxed{\frac{18\pi}{5}}$$

$$\left(\frac{18}{5}-2\right)\pi=\boxed{\frac{8\pi}{5}}$$

Negative Coterminal

$$\left(\frac{8}{5}-2\right)\pi=\boxed{\frac{-2\pi}{5}}$$