TOPIC: COFUNCTIONS OF COMPLEMENTARY ANGLES

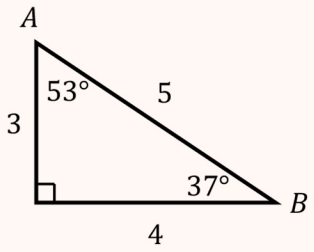
Cofunction Identities

◆ Angles which add to 90° are **Complementary**.

- In a right triangle, the _____ angles are *ALWAYS* complementary.

Complementary Angle Theorem Cofunctions of complementary angles are equal.

New **Cofunction Identities**



$$\sin 37° = \frac{3}{5} = \cos \_\_\_\_\_$$

$$\sin A = \cos B \quad \sec A = \csc B \quad \tan A = \cot B$$

$$*B = 90° - A \text{ or } \frac{\pi}{2} - A$$

EXAMPLE Write the expression in terms of the appropriate cofunction.

(*A*) $\sin 30°$

(*B*) $\tan 16°$

(*C*) $\sec 0°$

(*D*) $\cos \frac{5\pi}{18}$

TOPIC: COFUNCTIONS OF COMPLEMENTARY ANGLES

PRACTICE Write the expression in terms of the appropriate cofunction.

$\cos\left(\frac{19\pi}{45}\right)$

PRACTICE Write the expression in terms of the appropriate cofunction.

$\cot(25°)$

TOPIC: COFUNCTIONS OF COMPLEMENTARY ANGLES

Solving Equations using Cofunction Identities

◆ To solve trig equations, rewrite one side, then set arguments of the functions equal.

$$\sin(x - 10) = \cos(x)$$

$$\sin(x - 10) = \sin(90 - x)$$

$$x - 10 = 90 - x$$

Recall **Cofunction Identities**

$$\sin A = \cos(90° - A)$$

$$\sec A = \csc(90° - A)$$

$$\tan A = \cot(90° - A)$$

EXAMPLE Solve for θ in the following equation.

$\cos(\theta) = \sin(2\theta - 30°)$

HOW TO: Solve Trig Equations Using Cofunctions

1) Use cofunction identities to get the _____ trig functions on both sides of the = sign

2) Set the _____ of the functions equal

3) Solve for the missing variable.

TOPIC: COFUNCTIONS OF COMPLEMENTARY ANGLES

PRACTICE Find the acute angle solution to the following equation involving cofunctions. θ is in degrees.

$$\cos(2\theta + 15) = \sin(5\theta + 12)$$

PRACTICE Find the acute angle solution to the following equation involving cofunctions. P is in degrees.

$$\sec\left(\frac{4P}{5} + 20\right) = \csc\left(\frac{5P}{8} + \frac{223}{4}\right)$$

PRACTICE Find the acute angle solution to the following equation involving cofunctions. M is in radians.

$$\tan\left(\frac{M}{2} + 5\right) = \cot(M - 5)$$