

# Trig Identities Toolbox

Name: \_\_\_\_\_ Date: \_\_\_\_\_

## Reciprocal Identities

$$\csc x = \frac{1}{\sin x}$$

$$\sec x = \frac{1}{\cos x}$$

$$\cot x = \frac{1}{\tan x}$$

## Quotient Identities

$$\tan x = \frac{\sin x}{\cos x}$$

$$\cot x = \frac{\cos x}{\sin x}$$

## Pythagorean Identities

$$\sin^2 x + \cos^2 x = 1$$

→

$$1 - \cos^2 x = \sin^2 x$$

$$1 - \sin^2 x = \cos^2 x$$

$$1 + \tan^2 x = \sec^2 x$$

$$\cot^2 x + 1 = \csc^2 x$$

## FOIL/FACTOR

$$A^2 - B^2 = (A + B)(A - B)$$

$$(A + B)^2 = A^2 + 2AB + B^2$$

$$(A - B)^2 = A^2 - 2AB + B^2$$

**FACTOR OUT THE GCF**

## Trig Squared

$$\tan^2 x = \frac{\sin^2 x}{\cos^2 x}$$

## Trig Identities Strategies

1. **Change to Sine/Cosines** (Quotient identities/Reciprocal Identities)
2. **Pythagorean Identities** (Rearrange in any order)
3. **Break Apart a Fraction**
4. **Combine Fractions** (find a common denominator)
5. **Multiply by Conjugate**  $(1 + \sin x)(1 - \sin x) = 1 - \sin^2 x$
6. **Multiply by the Reciprocal** (fraction divided by a fraction)

\*7. **Factor Binomial**  $1 - \cos^2 x = (1 - \cos x)(1 + \cos x)$

**Factor Trinomial**

**Factor GCF:**  $\cos^3 x + \sin^2 x \cos x = \cos x (\cos^2 x + \sin^2 x)$

8. **Distribute or FOIL**

\*9. **Substitution:**  $\sin^2 x - \cos^2 x = 1 - 2\cos^2 x$

10. **Change order over subtraction:**  $\sin^2 x - 1 = -(1 - \sin^2 x)$

11. **Work with the right side**, instead of the left

