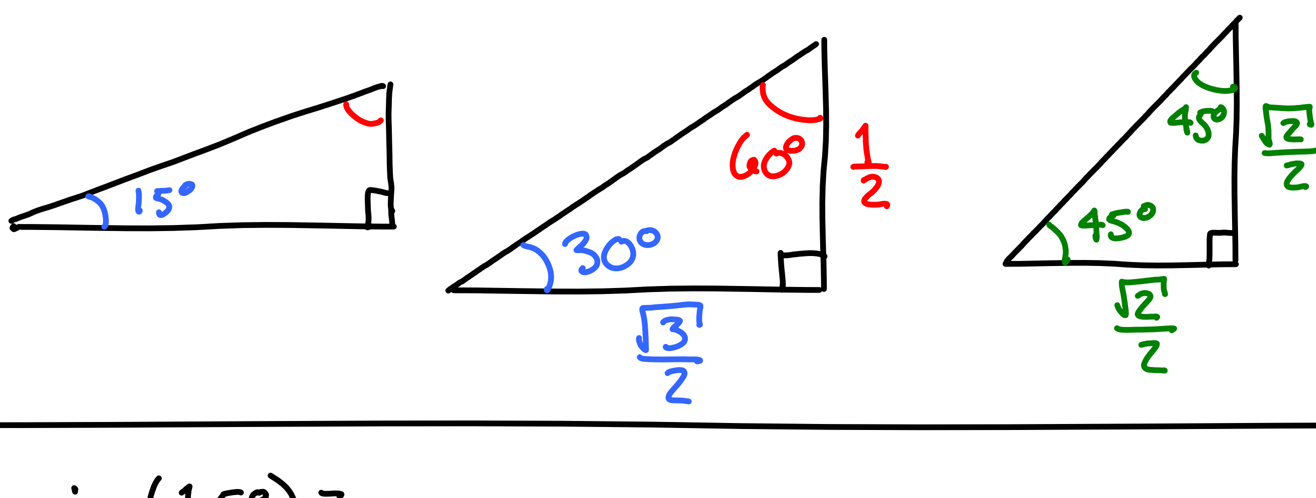
Sum and Difference

$\cos(\alpha+\beta)=$

$\sin(\alpha+\beta)=$

$\cos(\alpha-\beta)=$

$\cos(15^\circ)=$

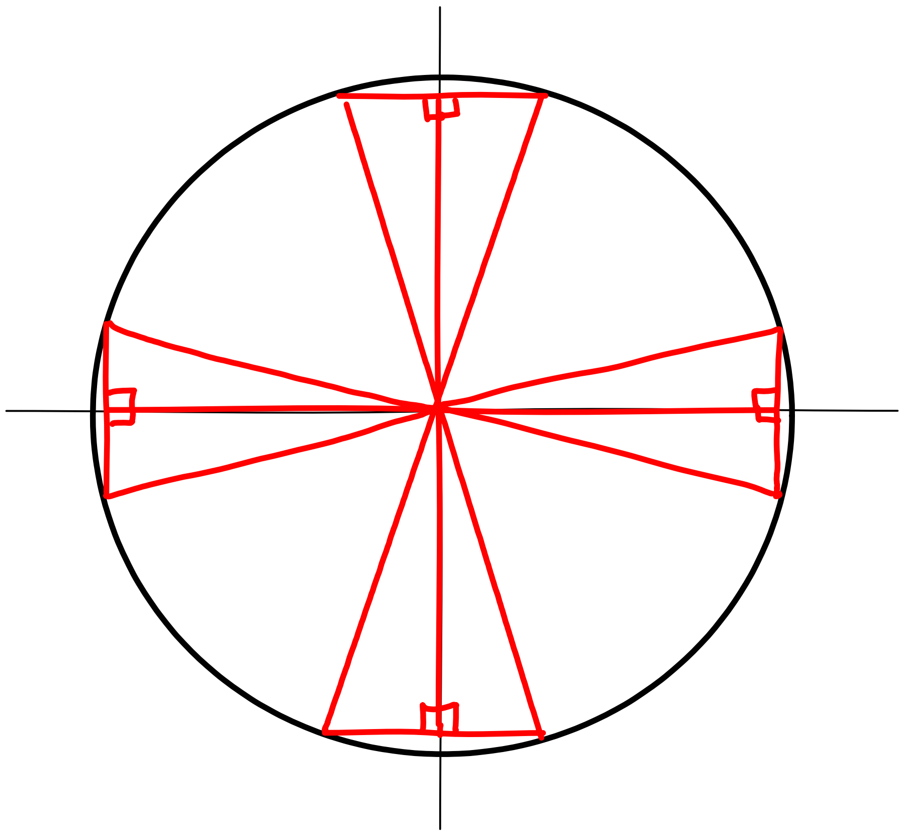


$\sin(15^\circ)=$

$\cos(75°) =$

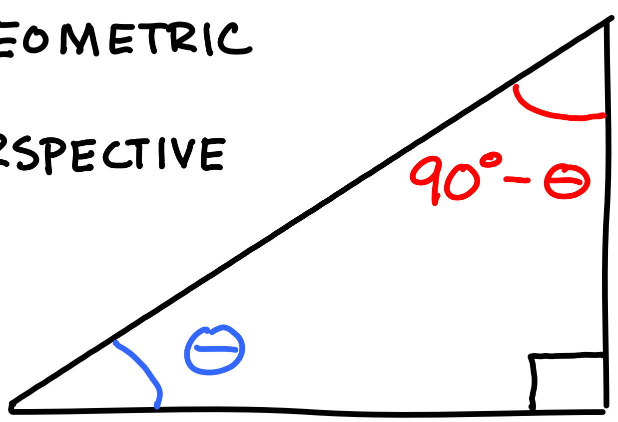
$\sin(75°) =$

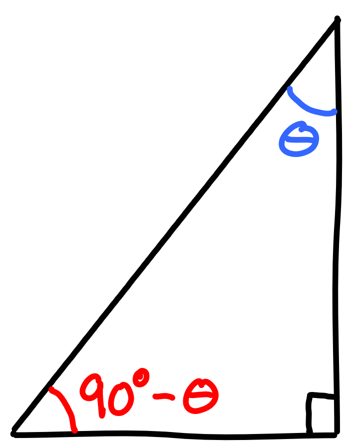
Extended Unit Circle



Cofunction Identities

Geometric Perspective





Cofunction Algebra

$\sin(\theta) =$

$\cos(\theta) =$

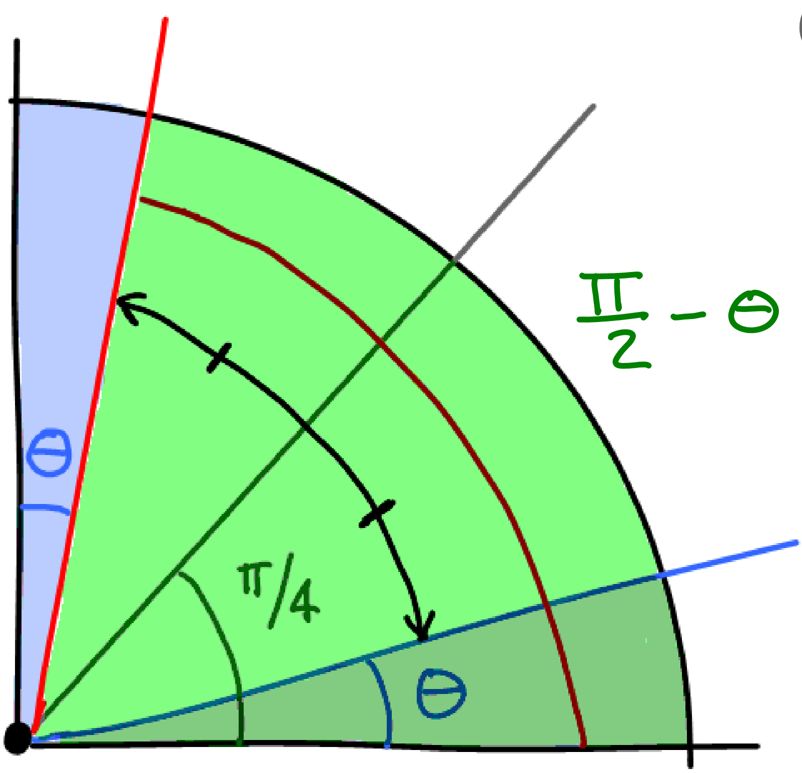
$\tan(\theta) =$

$\cot(\theta) =$

$\sec(\theta) =$

$\csc(\theta) =$

More Cofunction Geometry

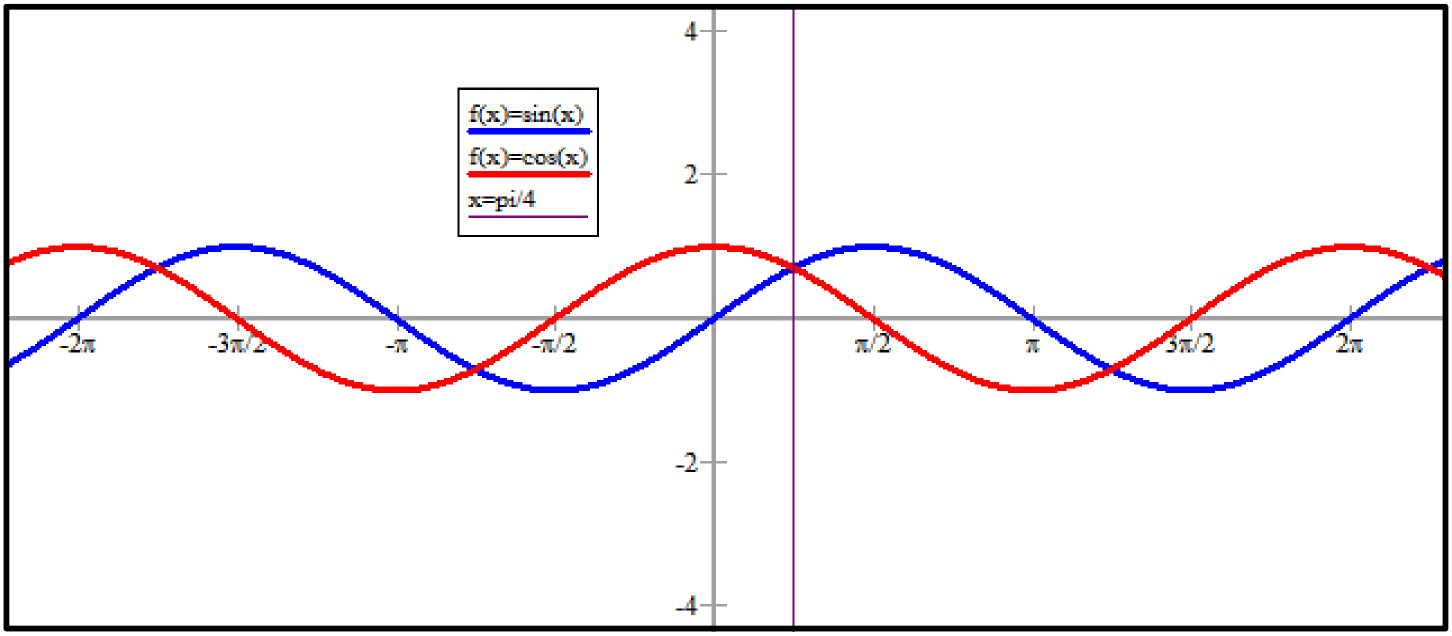


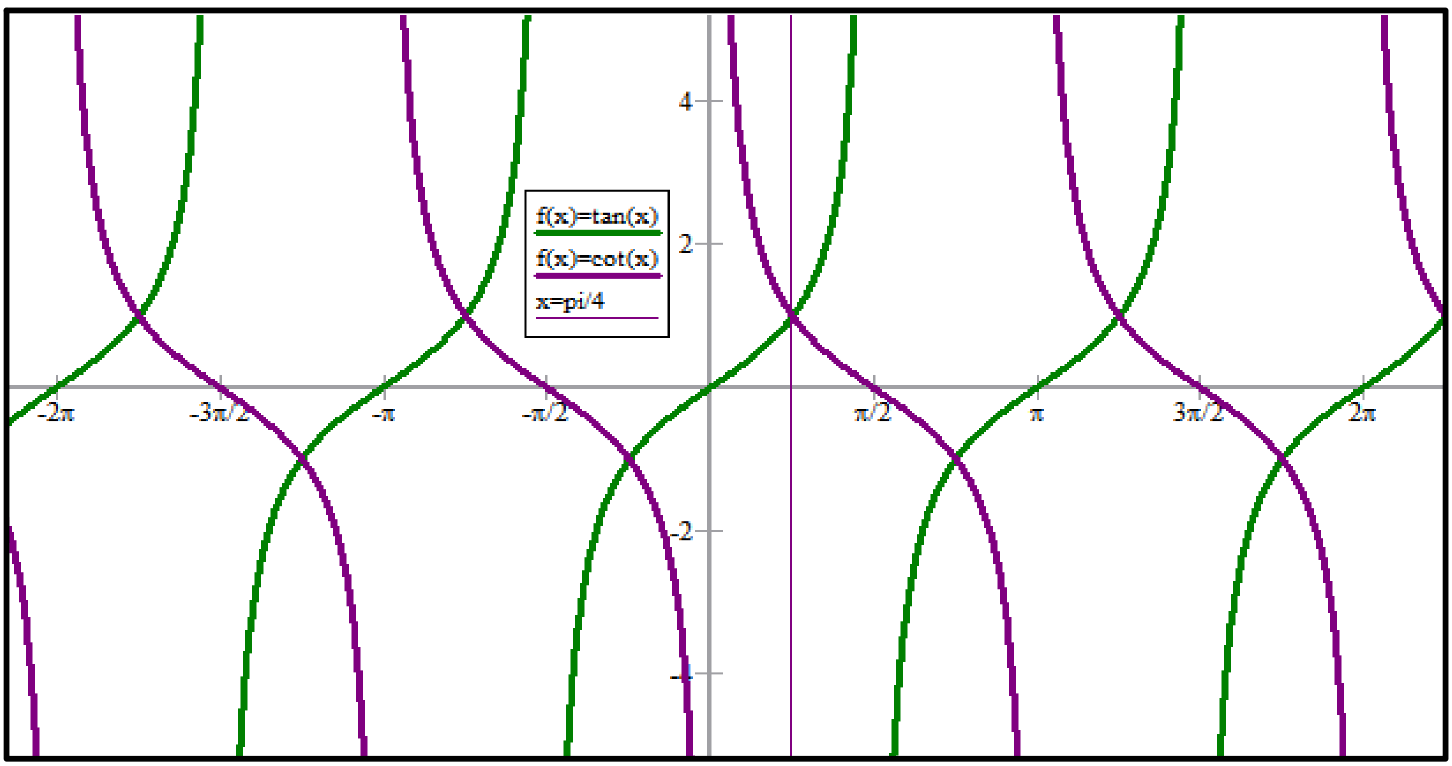
$\theta \longleftrightarrow \frac{\pi}{2} - \theta$

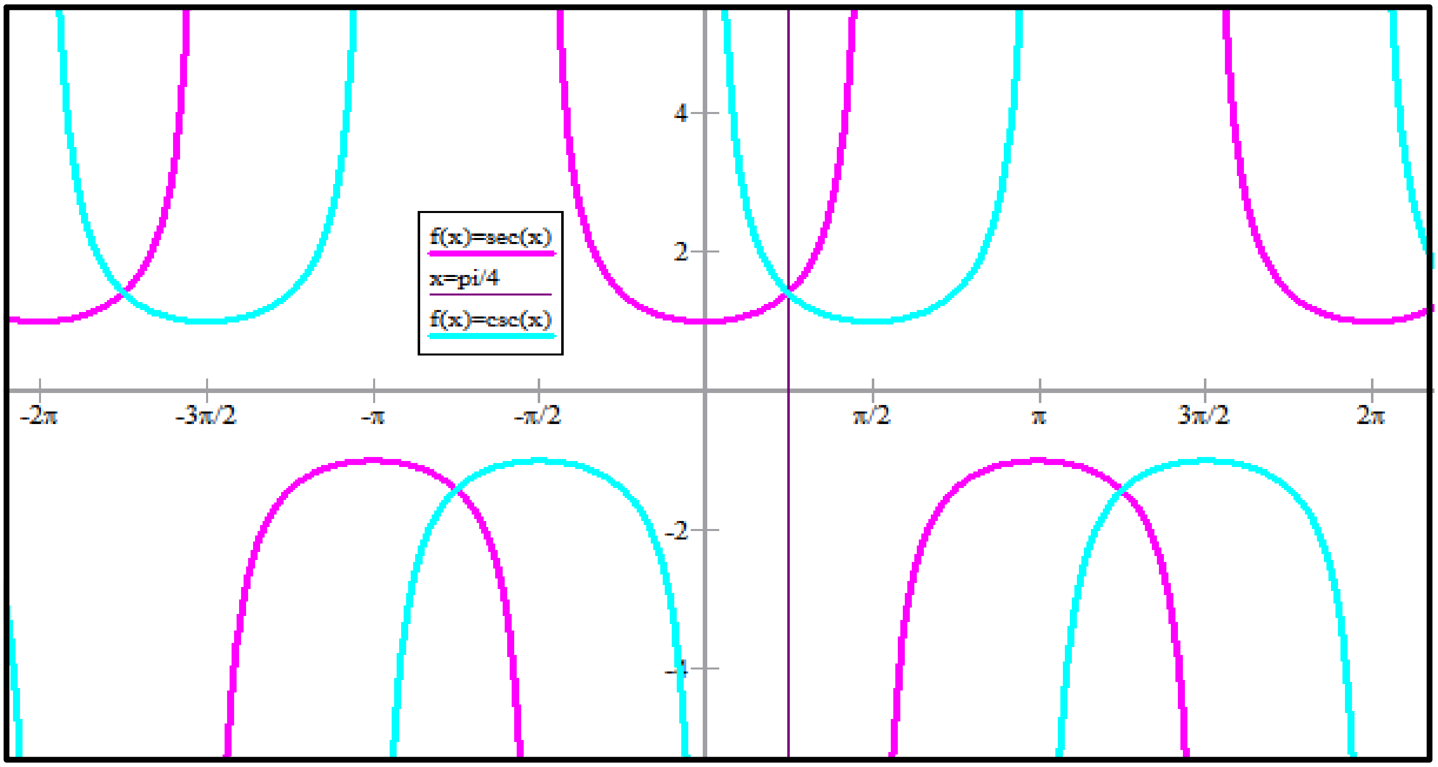
Flip over $\pi/4$

Graphical Representation of Cofunctions

Symmetry About the Vertical Line $x = \frac{\pi}{4}$

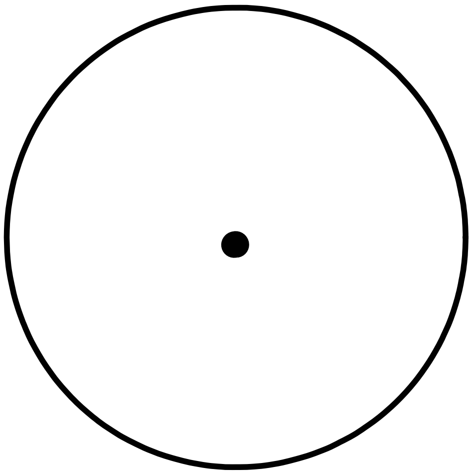


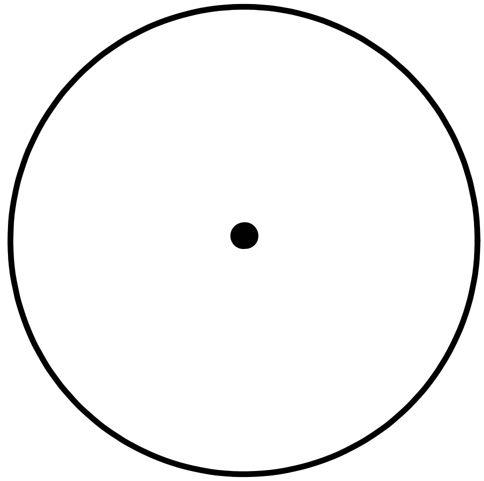




f(x)=sec(x)
x=pi/4
f(x)=csc(x)
4
2
-2
-4
-2π
-3π/2
-π
-π/2
π/2
π
3π/2
2π

Prove $\cos(\alpha - \beta) \equiv \cos\alpha\cos\beta + \sin\alpha\sin\beta$





DISTANCE FORMULA

IF $P_1 = (x_1, y_1)$ AND $P_2 = (x_2, y_2)$ THEN

$D(P_1, P_2) =$

$P_1 = (\cos\alpha, \cos\beta)$ $\quad$ $P_2 = (\cos\beta, \sin\beta)$

$P_3 = (\cos(\alpha-\beta), \sin(\alpha-\beta))$ $\quad$ $P_4 = (1, 0)$

$$D(P_1, P_2) = D(P_3, P_4)$$

FIND $\cos(\alpha+\beta)$ USING THE $\cos(\alpha-\beta)$ IDENTITY

$$\cos(\alpha-\beta) \equiv \cos\alpha\cos\beta + \sin\alpha\sin\beta$$

$\Rightarrow \cos(\alpha+\beta) =$

DERIVE $\sin(\alpha\pm\beta)$ USING THE $\cos(\alpha\pm\beta)$ IDENTITY

SIMPLIFY $\sin(2\theta)\sin(3\theta) - \cos(3\theta)\cos(2\theta)$

EVALUATE $\cos\left[\sin^{-1}\left(\frac{1}{3}\right) + \cos^{-1}\left(\frac{3}{4}\right)\right]$

WRITE TAN$(\alpha \pm \beta)$ IN TERMS OF TANα AND TANβ

$\tan(\alpha \pm \beta) =$

TANGENT SUM AND DIFFERENCE IDENTITIES

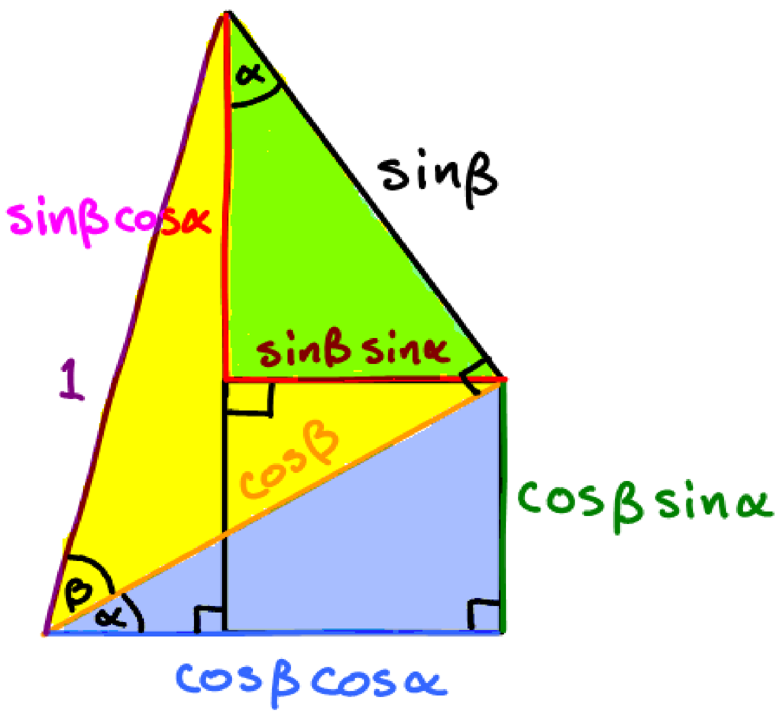
$$\text{TAN}(\alpha \pm \beta) = \frac{\text{TAN}\alpha \pm \text{TAN}\beta}{1 \mp \text{TAN}\alpha\,\text{TAN}\beta}$$

PROVE $\tan(\theta + \pi/2) \equiv -\cot\theta$

A) USING SUM IDENTITIES

B) USING COFUNCTION IDENTITIES

Verify the Pythagorean Theorem for the 3 Right Triangles.



WRITE $\cos(2\theta)$ IN TERMS OF $\cos\theta$ AND $\sin\theta$