

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

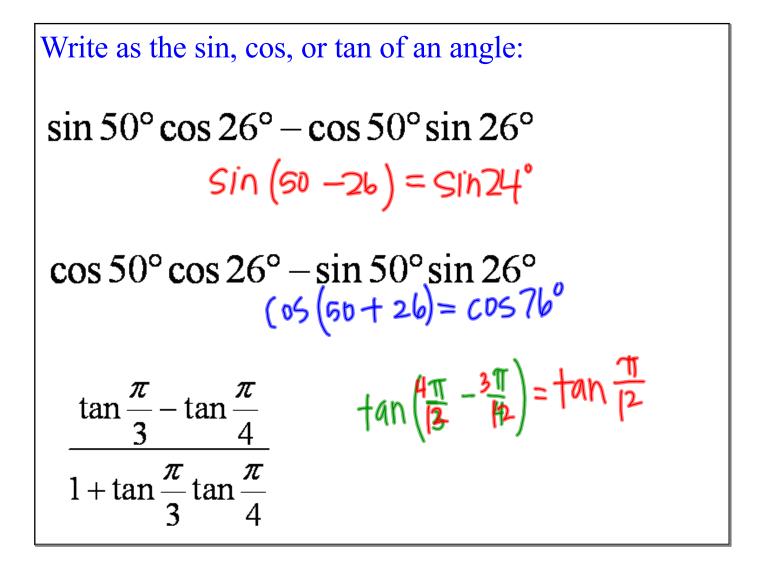
$\sin(\alpha - \beta) = \sin \alpha \cos \beta - \cos \alpha \sin \beta$ $\sin(\alpha + \beta) = \sin \alpha \cos \beta + \cos \alpha \sin \beta$

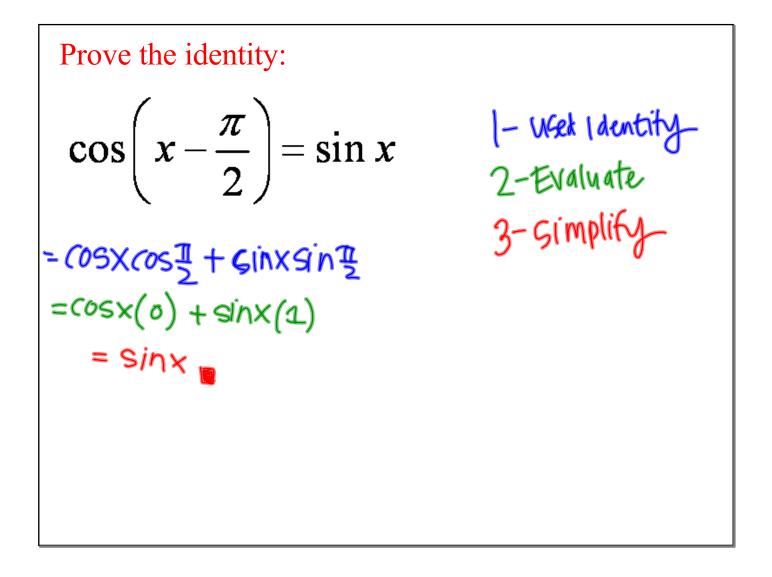
$$\tan(\alpha + \beta) = \frac{\tan \alpha + \tan \beta}{1 - \tan \alpha \tan \beta}$$
$$\tan(\alpha - \beta) = \frac{\tan \alpha - \tan \beta}{1 + \tan \alpha \tan \beta}$$

Find the exact value of:

$$\cos 105^\circ = (0.5(45+10)) = \cos 45 \cos 0 - \sin 455 \sin 100$$

 $\frac{\sqrt{5}}{2} \cdot \frac{1}{2} - \frac{\sqrt{5}}{2} \cdot \frac{\sqrt{5}}{2} = \frac{\sqrt{2}}{4} - \frac{\sqrt{6}}{4} = \sqrt{\frac{12}{4}} - \frac{\sqrt{6}}{4}$
 $\sin 15^\circ = \sin(45-30) = \sin^{45}\cos 30^{-5}\cos(55) \sin^{30}$
 $\tan\left(\frac{5\pi}{12}\right) = \tan\left(\frac{\pi}{6} + \frac{\pi}{4}\right) = \frac{\tan(\pi + \tan \pi)}{1 - \tan(\pi + \tan \pi)}$
 $\frac{\pi}{12} = \frac{2\pi}{12} = \frac{\pi}{3} + \frac{3}{3} = \frac{\sqrt{5}}{3-\sqrt{5}} = \frac{3+\sqrt{5}}{3-\sqrt{5}} = \frac{3+\sqrt{5}}{5-\sqrt{5}} = \frac{3+\sqrt{5}}{5-\sqrt{5}}$





If one of the angles in a sum or difference is a quadrantal angle (multiple of 90 or $\pi/2$) then the sum-difference identities yield single-termed expressions.

We call these reduction formulas

$$\sin(x-y) + \sin(x+y) = 2\sin x \cos y$$

$$\int (x-y) + \sin(x+y) = 2\sin x \cos y$$

$$\int (x-y) + \cos y + \cos y + \cos y + \sin y$$

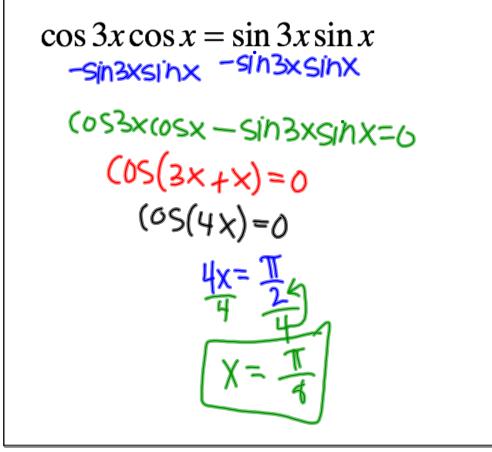
$$= 2\sin x \cos y = \cos y$$



cos(x-3)(05X(053+5(hxsin)3)

cos(3-2x) (05(-2x+3)) (05(-2(x-3/2))) $\frac{2\pi}{2} = \pi$





 $\sin(3x) = 3\cos^2 x \sin x - \sin^3 x$ Sin(2x+x) = sin(2x cosx + cos2x sinx) = sin(x+x)cosx + cos(x+x)sinsin(x+x)s $Sinx(\sigma s^{2}x + cos^{2}x sinx + cos^{2}x sinx - 5in^{3}x$ $3cos^{2}x sinx - 5in^{3}x$