§7.4 Sum and Difference Formulas

REMEMBER YOU KNOW ALGEBRA !

Sum or Difference of Two Angles Identities
$\cos(\alpha - \beta) = \cos\alpha\cos\beta + \sin\alpha\sin\beta$
$\cos(\alpha + \beta) = \cos\alpha\cos\beta - \sin\alpha\sin\beta$
$\sin(\alpha - \beta) = \sin\alpha\cos\beta - \cos\alpha\sin\beta$
$\sin(\alpha + \beta) = \sin\alpha\cos\beta + \cos\alpha\sin\beta$
$\tan(\alpha + \beta) = \dfrac{\tan\alpha + \tan\beta}{1 - \tan\alpha\tan\beta}$
$\tan(\alpha - \beta) = \dfrac{\tan\alpha - \tan\beta}{1 + \tan\alpha\tan\beta}$

Cofunction Identities	
$\sin(90° - \theta) = \cos\theta$	$\cos(90° - \theta) = \sin\theta$
$\tan(90° - \theta) = \cot\theta$	$\cot(90° - \theta) = \tan\theta$
$\sec(90° - \theta) = \csc\theta$	$\csc(90° - \theta) = \sec\theta$

Example 1 Find the exact value. $\cos 75^{\circ}$

Example 2 Find the exact value. $\cos \frac{\pi}{12}$

Example 3 Find the exact value.

$\sin 80^{\circ} \cos 20^{\circ} - \cos 80^{\circ} \sin 20^{\circ}$

Example 4 Prove a Cofunction $\cos\left(\frac{\pi}{2} - x\right)$

Example 5 Simplify.

(Identity)

$\tan(\theta + \pi)$

Example 6 Given $\sin\alpha = \frac{4}{5}$, α in quadrant II, and $\sin\beta = \frac{-2\sqrt{5}}{5}$, in quadrant III, find $\cos(\alpha + \beta)$