Sum and Difference Formulas

$\sin(u + v) = \sin u \cos v + \cos u \sin v$
$\sin(u - v) = \sin u \cos v - \cos u \sin v$

$\cos(u + v) = \cos u \cos v - \sin u \sin v$
$\cos(u - v) = \cos u \cos v + \sin u \sin v$

$\tan(u + v) = \frac{(\tan u + \tan v)}{(1 - \tan u \tan v)}$ $\tan(u - v) = \frac{(\tan u - \tan v)}{(1 + \tan u \tan v)}$

Example 1: Find the exact value of each (without using a calculator).

a. $\sin \frac{\pi}{12}$

b. $\cos \frac{7\pi}{12}$

c. $\tan \left(-\frac{\pi}{12}\right)$

Example 2: Find the exact value of sine of 75° (without using a calculator).

Example 3: Write the expression as the sine, cosine, or tangent of the angle. Then, find the exact value of the expression.

a. $\cos\frac{\pi}{16}\cos\frac{3\pi}{16} - \sin\frac{\pi}{16}\sin\frac{3\pi}{16}$

b. $\sin 120° \cos 30° - \cos 120° \sin 30°$

c. $\frac{\tan 25° + \tan 110°}{1 - \tan 25° \tan 110°}$

Homework: page 402 #1 – 6 all, 13 – 41 odd