Name: _________________________ Date: ___________________

| Learning Goal 6.1 | Using identities to reduce complexity in expressions and solve equations. |
|---|---|

**Sum and Difference Identities**

$$\cos(A+B) = \cos A\cos B - \sin A\sin B \qquad \sin(A+B) = \sin A\cos B + \cos A\sin B$$

$$\cos(A-B) = \cos A\cos B + \sin A\sin B \qquad \sin(A-B) = \sin A\cos B - \cos A\sin B$$

$$\tan(A+B) = \frac{\tan A + \tan B}{1 - \tan A\tan B} \qquad \tan(A-B) = \frac{\tan A - \tan B}{1 + \tan A\tan B}$$

**Example** Verify the identity $\sin(A-B) = \sin A\cos B - \cos A\sin B$ numerically, without a calculator, for

$$\measuredangle A = \frac{\pi}{3} \quad \text{and} \quad \measuredangle B = \frac{\pi}{4}.$$

**Example** Express the following as a trigonometric function of a single angle.

$$sin(\pi)\,cos\left(\frac{\pi}{5}\right) - cos(\pi)\,sin\left(\frac{\pi}{5}\right)$$

**Example** Simplify and then give an exact value for each expression.

a. $\cos 25^\circ \cos 5^\circ - \sin 25^\circ \sin 5^\circ$

b. $\sin\frac{\pi}{3}\cos\frac{\pi}{6} + \cos\frac{\pi}{3}\sin\frac{\pi}{6}$

Assignment p. 306 # 1(abd), 2(abd), 6, 7, 8(ace), 9, 10, 19, 20(ab) Quiz Next Day!

**Example** Simplify $\sin(x - \pi)$.

**Example** Determine the exact value of $\tan\left(\frac{\pi}{12}\right)$.

**Example** If $\sin A = \frac{1}{5}$ and $\cos B = \frac{4}{7}$, $\measuredangle A$ is in QII and $\measuredangle B$ is in Q1, find an exact value for $\cos(A + B)$.

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