6.2 Sum and Difference Identities

SLO: I can use *Sum and Difference Identities* to determine the exact trig values of some angles and to prove that given equations are identities.

A common misunderstanding is to think that $\cos(40° + 25°) = \cos 40° + \cos 25°$.

Check with your calculators!

There are, however, identities that we can use for this situation, when we are adding 2 angles together:

Sum and Difference Identities for Cosine

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

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

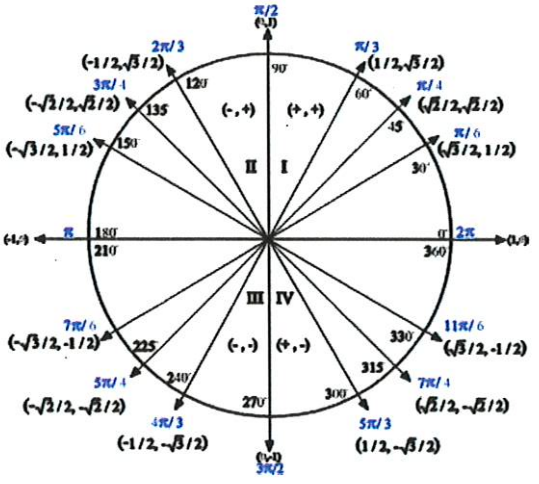
We can use these identities to determine the exact trig value of some angles.

EX: Find the exact value of $\cos 15°$.

Before, we would have to use our calculator to get an approximate value. Remember that EXACT VALUE means simplest fraction/radical form.

We can re-write $\cos 15°$ **as**

which equals



Sum and Difference Identities for Sine

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

EX: Find the exact value of $\sin 105°$.

Sum and Difference Identities for Tangent

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

EX: Find the exact value of $\tan 105°$.

EX: Rewrite the statement a single trig function or an angle: $\cos 45°\cos 25°-\sin 45°\sin 25°$