Section 5.4 – Sum and Difference Formulas

Don't worry, you do not have to memorize the following formulas,
but you have to know how to use them

$$\sin(\theta+\beta)=\sin\theta\cos\beta+\cos\theta\sin\beta$$

$$\sin(\theta-\beta)=\sin\theta\cos\beta-\cos\theta\sin\beta$$

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

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

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

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

The goal here is to find two angles with REFERENCE angles of 30°, 45° or 60° that can be combined to get the angle you need.

Ex. 1) Find the EXACT value of the following – no decimals!

      a. $\sin 75°$

      b. $\cos 255°$

      c. $\tan 105°$

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Ex. 2) Write the expression as the sine, cosine, or tangent of the angle and find the exact value: (so basically, match to one of the formulas on the first page)

a. $\sin 42° \cos 12° - \cos 42° \sin 12°$

b. $\cos 27° \cos 18° - \sin 27° \sin 18°$

c. $\dfrac{\tan 75° - \tan 15°}{1 + \tan 75° \tan 15°}$

Ex. 3) Find the exact value (no decimals) of the trig function given that

$$\sin u = \frac{5}{13} \text{ and } \cos v = \frac{-3}{5} \text{ (\textbf{both} u and v are in Quadrant II)}$$

$\sin(v - u) =$

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Ex. 4) Find the exact value of the trig function given that $\sin u = \dfrac{-7}{25}$ and $\cos v = \dfrac{-4}{5}$.

If both u and v are in the same quadrant, they must be in Quadrant _____

$$\tan(u-v)=$$

Ex. 5) Verify the Identity (Yes, it's back!)

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

HW: p. 404-405 #1, 7, 9, 15-18, 23-26, 31, 32, 37, 39, 41, 56, 63