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

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

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

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

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

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

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

Ex. 1) 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. $\sin 42^\circ \cos 12^\circ - \cos 42^\circ \sin 12^\circ$

b. $\cos 27^\circ \cos 18^\circ - \sin 27^\circ \sin 18^\circ$

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

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The goal on this next set of problems 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. $\sin 75^\circ$

b. $\cos 255^\circ$

c. $\tan 105^\circ$

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

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

$\sin(v-u)=$

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

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

$\tan(u-v)=$

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

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

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

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

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

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

Ex. 6) Solve the equation (Yes, it's back too!!)

$$\sin 2x\cos x+\cos 2x\sin x=\frac{1}{2}$$

HW: p. 404-405 #1, 9, 15, 17, 23, 25, 31, 37, 63