5-4   Notes on Sum and Difference Formulas (continued)

$$\sin(u \pm v) = \sin u \cos v \pm \cos u \sin v$$

$$\cos(u \pm v) = \cos u \cos v \mp \sin u \sin v$$

$$\tan(u \pm v) = \frac{\tan u \pm \tan v}{1 \mp \tan u \tan v}$$

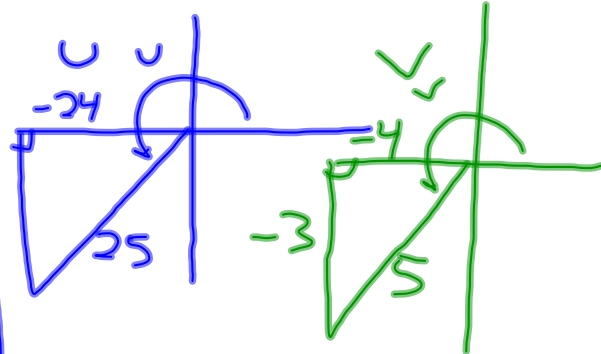$$\sin 15°$$

$$\sin(45° - 30°)$$

$$u - v$$

Ex. 1   Given: $\sin u = -\dfrac{7}{25}$ $\cos v = -\dfrac{4}{5}$

u and v are in quadrant III

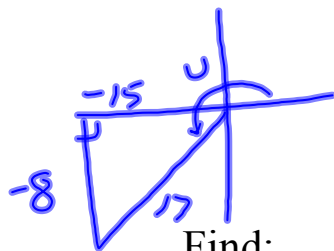Find: $\cos(u + v)$

$\cos u \cos v - \sin u \sin v$

$-\dfrac{24}{25} \cdot \dfrac{-4}{5} - \dfrac{-7}{25} \cdot \dfrac{-3}{5}$

$\dfrac{96}{125} - \dfrac{21}{125} = \dfrac{75}{125} = \boxed{\dfrac{3}{5}}$
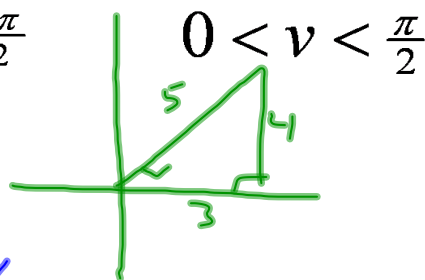
$\sin(u - v)$

$\sin u \cos v - \cos u \sin v$

$-\dfrac{7}{25} \cdot \dfrac{-4}{5} - \dfrac{-24}{25} \cdot \dfrac{-3}{5} = \dfrac{28}{125} - \dfrac{72}{125} = \boxed{-\dfrac{44}{125}}$

Ex. 2   Given: $\cos u = -\dfrac{15}{17}$ $\sin v = \dfrac{4}{5}$

$\pi < u < \dfrac{3\pi}{2}$ $0 < v < \dfrac{\pi}{2}$

Find: $\sin(u - v)$

$\sin u \cos v - \cos u \sin v$

$-\dfrac{8}{17} \cdot \dfrac{3}{5} - \dfrac{-15}{17} \cdot \dfrac{4}{5} = \dfrac{-24}{85} + \dfrac{+60}{85} = \dfrac{36}{85}$

$\cos(u + v)$

$\cos u \cos v - \sin u \sin v$

$-\dfrac{15}{17} \cdot \dfrac{3}{5} - \dfrac{-8}{17} \cdot \dfrac{4}{5} = \dfrac{-45}{85} + \dfrac{+32}{85} = \dfrac{-13}{85}$

Homework
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