SUM AND DIFFERENCE IDENTITIES FOR COSINE

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

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

1. Use the sum or difference identities to find the exact value. → no calculator answers.

$\cos 15°$

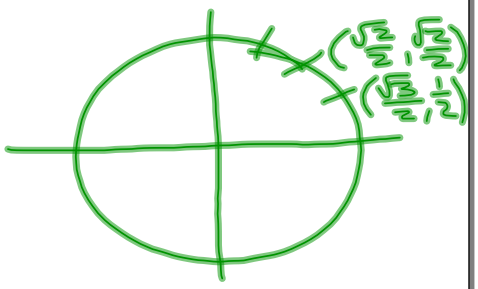
$= \cos(45° - 30°)$ ≠ $\cos 45° - \cos 30°$ NOT EQUAL!

$= \cos(45°)\cos(30°) + \sin(45°)\sin(30°)$

$= \left(\frac{\sqrt{2}}{2}\right)\left(\frac{\sqrt{3}}{2}\right) + \left(\frac{\sqrt{2}}{2}\right)\left(\frac{1}{2}\right)$

$= \frac{\sqrt{6}}{4} + \frac{\sqrt{2}}{4}$

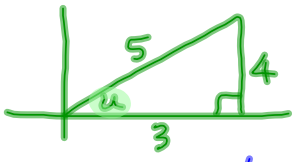
$= \boxed{\frac{\sqrt{6}+\sqrt{2}}{4}}$



2. Find the exact value of each trigonometric function, given:

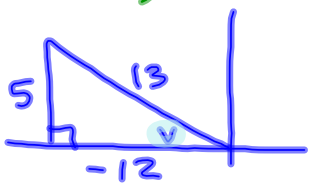
QI

$\sin u = \frac{4}{5}$, where $0 < u < \frac{\pi}{2}$ and



QII

$\cos v = -\frac{12}{13}$, where $\frac{\pi}{2} < v < \pi$.



a. $\cos(u + v)$

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

$= \left(\frac{3}{5}\right)\left(\frac{-12}{13}\right) - \left(\frac{4}{5}\right)\left(\frac{5}{13}\right) = -\frac{36}{65} - \frac{20}{65} = \boxed{-\frac{56}{65}}$

b. $\cos(v - u)$

$= \cos v \cdot \cos u + \sin v \cdot \sin u$

$= \left(-\frac{12}{13}\right)\cdot\left(\frac{3}{5}\right) + \left(\frac{5}{13}\right)\cdot\left(\frac{4}{5}\right) = -\frac{36}{65} + \frac{20}{65} = \boxed{-\frac{16}{65}}$