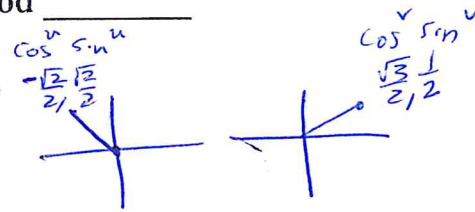


1) Find the exact value of each expression. **Circle** your answers.

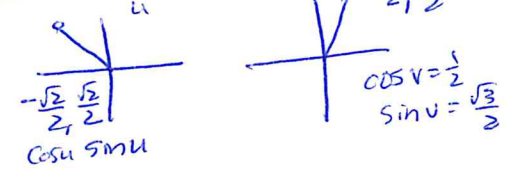
A) $\sin\left(\frac{11\pi}{12}\right) = \sin\left(\frac{9\pi}{12} + \frac{2\pi}{12}\right) = \sin\left(\frac{3\pi}{4} + \frac{\pi}{6}\right)$

$\sin(u+v) = \sin u \cos v + \cos u \sin v$
 $= \frac{\sqrt{2}}{2} \cdot \frac{\sqrt{3}}{2} + \frac{-\sqrt{2}}{2} \cdot \frac{1}{2} = \frac{\sqrt{6}-\sqrt{2}}{4}$



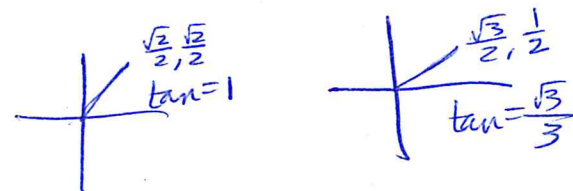
B) $\cos\left(\frac{13\pi}{12}\right) = \cos\left(\frac{9\pi}{12} + \frac{4\pi}{12}\right) = \cos\left(\frac{3\pi}{4} + \frac{\pi}{3}\right)$

$\cos u \cos v - \sin u \sin v$
 $= \frac{-\sqrt{2}}{2} \cdot \frac{1}{2} - \frac{\sqrt{2}}{2} \cdot \frac{\sqrt{3}}{2} = \frac{-\sqrt{2}-\sqrt{6}}{4}$



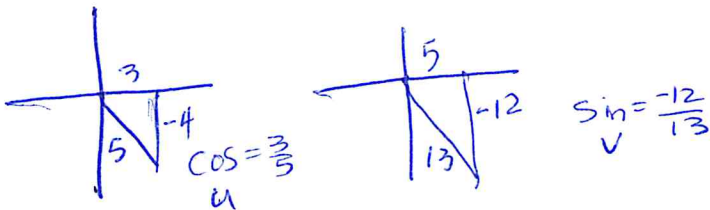
C) $\tan(75^\circ) = \tan(45^\circ + 30^\circ)$

$\tan(u+v) = \frac{\tan u + \tan v}{1 - \tan u \tan v}$
 $= \frac{1 + \frac{\sqrt{3}}{3}}{1 - \frac{\sqrt{3}}{3}} = \frac{3+\sqrt{3}}{3-\sqrt{3}}$



2) Let $\sin u = -\frac{4}{5}$ and $\cos v = \frac{5}{13}$ with both u and v in quadrant IV.

Draw angle u and angle v in the 4th quadrant then find the value of each of the following.



A) $\sin(u-v) = \sin u \cos v - \cos u \sin v$
 $= -\frac{4}{5} \cdot \frac{5}{13} - \frac{3}{5} \cdot \frac{12}{13} = \frac{-20}{65} - \frac{36}{65} = \frac{16}{65}$

B) $\cos(v+u) = \cos v \cos u - \sin v \sin u$
 $= \frac{5}{13} \cdot \frac{3}{5} - \frac{12}{13} \cdot \frac{4}{5} = \frac{15}{65} - \frac{48}{65} = \frac{-33}{65}$

3) Find the solution(s) for the equation given below in the interval $[0, 2\pi)$.

$$\sin\left(x + \frac{\pi}{6}\right) + \sin\left(x - \frac{\pi}{6}\right) = \frac{\sqrt{3}}{2}$$

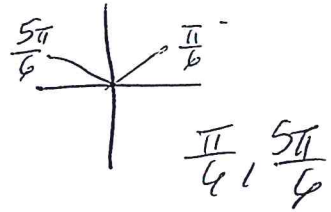
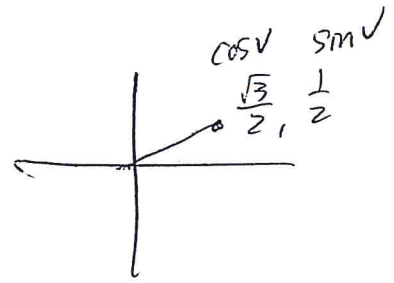
$$\sin(u+v) = \sin u \cos v + \cos u \sin v$$

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

$$(\sin x) \cdot \frac{\sqrt{3}}{2} + (\cos x) \cdot \frac{1}{2} + \sin x \cdot \frac{\sqrt{3}}{2} - \cos x \cdot \frac{1}{2}$$

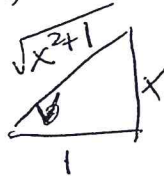
$$2 \sin x \cdot \frac{\sqrt{3}}{2}$$

$$\sqrt{3} \sin x = \frac{\sqrt{3}}{2} - \frac{1}{\sqrt{3}} \quad \sin x = \frac{1}{2}$$



4) Write the trigonometric expression as an algebraic expression.

$$\cos(\arcsin x - \arctan x)$$



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

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

$$\frac{\sqrt{1-x^2}}{1} \cdot \frac{1}{\sqrt{x^2+1}} - x \cdot \frac{x}{\sqrt{x^2+1}}$$

$$\frac{\sqrt{1-x^2} - x^2}{\sqrt{x^2+1}}$$