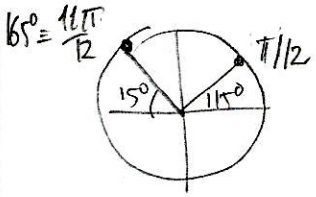
10.

a) $\sin \frac{11\pi}{12} = \sin \frac{\pi}{12}$



Mas

$15° \equiv 45° - 30°$

$\frac{\pi}{12} = \frac{\pi}{4} - \frac{\pi}{6}$

$$\sin \frac{\pi}{12} \equiv \sin\left(\frac{\pi}{4} - \frac{\pi}{6}\right) =$$

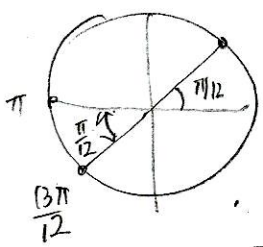
$$= \sin\frac{\pi}{4}\cos\frac{\pi}{6} - \sin\frac{\pi}{6}\cos\frac{\pi}{4}$$

$$= \frac{\sqrt{2}}{2}\frac{\sqrt{3}}{2} - \frac{1}{2}\frac{\sqrt{2}}{2}$$

$$= \frac{\sqrt{2}}{4}(\sqrt{3}-1)$$

$$\therefore \boxed{\sin \frac{11\pi}{12} = \frac{\sqrt{2}}{4}(\sqrt{3}-1)}$$

b) $\cos \frac{13\pi}{12} = -\cos\frac{\pi}{12}$



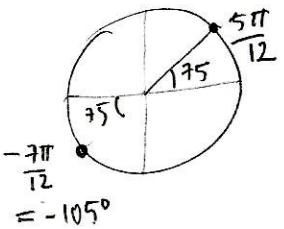
$$= -\cos\left(\frac{\pi}{4} - \frac{\pi}{6}\right)$$

$$= -\left(\cos\frac{\pi}{4}\cos\frac{\pi}{6} + \sin\frac{\pi}{4}\sin\frac{\pi}{6}\right)$$

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

$$\boxed{\cos\frac{13\pi}{12} = -\frac{\sqrt{2}}{4}(\sqrt{3}+1)}$$

c) $\operatorname{tg}\left(-\frac{7\pi}{12}\right) = \operatorname{tg}\frac{5\pi}{12} =$



$$= \operatorname{tg}\left(\frac{\pi}{4} + \frac{\pi}{6}\right)$$

$$= \frac{\operatorname{tg}\frac{\pi}{4} + \operatorname{tg}\frac{\pi}{6}}{1 - \operatorname{tg}\frac{\pi}{4}\operatorname{tg}\frac{\pi}{6}}$$

$75° = 45° + 30°$

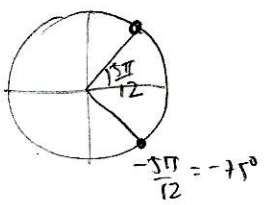
$\frac{5\pi}{12} = \frac{\pi}{4} + \frac{\pi}{6}$

$$= \frac{1 + \frac{1}{\sqrt{3}}}{1 - 1\cdot\frac{1}{\sqrt{3}}} = \frac{\frac{\sqrt{3}+1}{\sqrt{3}}}{\frac{\sqrt{3}-1}{\sqrt{3}}}$$

$$\therefore \boxed{\operatorname{tg}\left(-\frac{7\pi}{12}\right) = \frac{\sqrt{3}+1}{\sqrt{3}-1}}$$

d) $\operatorname{tg}\left(-\frac{5\pi}{12}\right) = -\operatorname{tg}\left(\frac{5\pi}{12}\right)$

$$= -\operatorname{tg}\left(\frac{\pi}{4} + \frac{\pi}{6}\right)$$



$$= -\frac{\operatorname{tg}\frac{\pi}{4} + \operatorname{tg}\frac{\pi}{6}}{1 - \operatorname{tg}\frac{\pi}{4}\operatorname{tg}\frac{\pi}{6}}$$

$$\boxed{\operatorname{tg}\left(-\frac{5\pi}{12}\right) = -\frac{\sqrt{3}+1}{\sqrt{3}-1}}$$

e) $\sin 75° = \sin(45° + 30°)$

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

$$= \frac{\sqrt{2}}{2}\frac{\sqrt{3}}{2} + \frac{1}{2}\frac{\sqrt{2}}{2}$$

$$\boxed{\sin 75° = \frac{\sqrt{2}}{4}(1+\sqrt{3})}$$