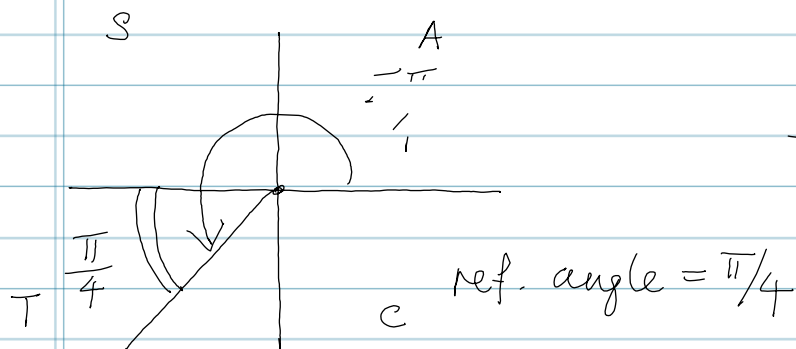


Sample Questions Set 15

1. $\sin\left(\frac{5\pi}{4}\right) = -\sin\frac{\pi}{4}$

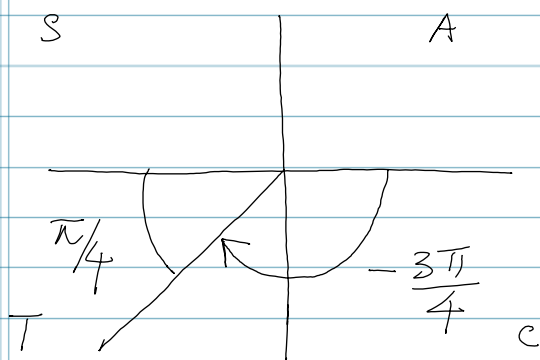
$$\cos\left(\frac{5\pi}{4}\right) = -\cos\frac{\pi}{4}$$



$$\tan\left(\frac{5\pi}{4}\right) = +\tan\frac{\pi}{4}$$

2. $\sin\left(-\frac{3\pi}{4}\right) = -\sin\frac{\pi}{4}$

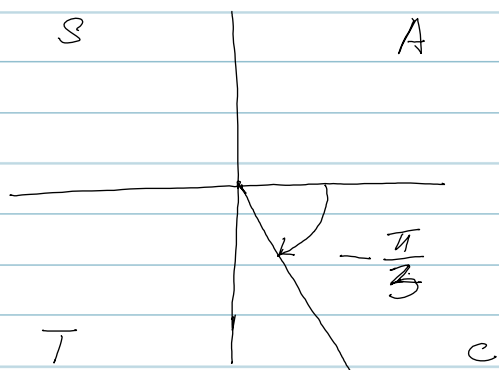
$$\cos\left(-\frac{3\pi}{4}\right) = -\cos\frac{\pi}{4}$$



$$\tan\left(-\frac{3\pi}{4}\right) = +\tan\frac{\pi}{4}$$

3. $\sin\left(-\frac{\pi}{3}\right) = -\sin\frac{\pi}{3}$

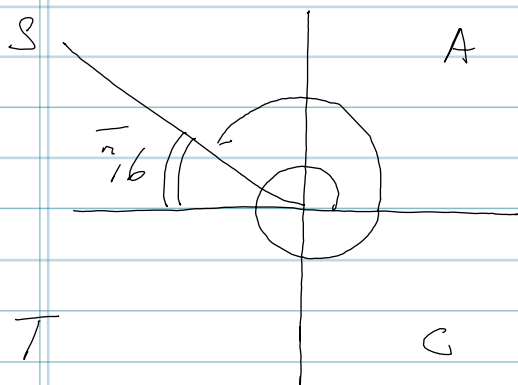
$$\cos\left(-\frac{\pi}{3}\right) = +\cos\frac{\pi}{3}$$



$$\tan\left(-\frac{\pi}{3}\right) = -\tan\frac{\pi}{3}$$

$$\frac{17}{6} = 2 + \frac{5}{6}$$

$$4. \quad \sin\left(\frac{17\pi}{6}\right) = \sin\frac{\pi}{6} \quad \cos\left(\frac{17\pi}{6}\right) = -\cos\frac{\pi}{6}$$



$$\tan\left(\frac{17\pi}{6}\right) = -\tan\frac{\pi}{6}$$

$$\text{ref. angle} = \pi/6$$

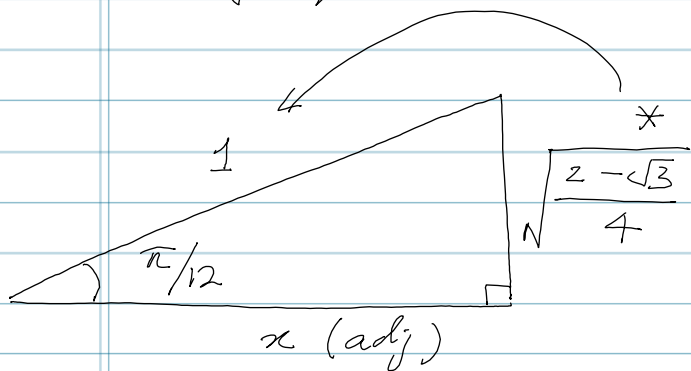
$$\begin{aligned} \textcircled{5.} \quad \sin\left(\frac{17\pi}{6}\right) &= \sin\frac{\pi}{6} & \cos\left(\frac{17\pi}{6}\right) &= -\cos\frac{\pi}{6} \\ &= \frac{1}{2} & &= -\frac{\sqrt{3}}{2} \end{aligned}$$

$$\begin{aligned} \tan\left(\frac{17\pi}{6}\right) &= -\tan\frac{\pi}{6} = -\frac{1}{\sqrt{3}} \\ &= -\frac{\sqrt{3}}{3} \end{aligned}$$

15°

6. Given: $\sin\left(\frac{\pi}{12}\right) = \sqrt{\frac{2-\sqrt{3}}{4}}$ ← *

(6a) $\cos\left(\frac{\pi}{12}\right) = \frac{x}{1} = \sqrt{\frac{2+\sqrt{3}}{4}}$



$$1 = x^2 + \left(\sqrt{\frac{2-\sqrt{3}}{4}}\right)^2$$

$$1 = x^2 + \frac{2-\sqrt{3}}{4}$$

$$x^2 = 1 - \frac{2-\sqrt{3}}{4} = \frac{4-2+\sqrt{3}}{4}$$

$$= \frac{2+\sqrt{3}}{4}$$

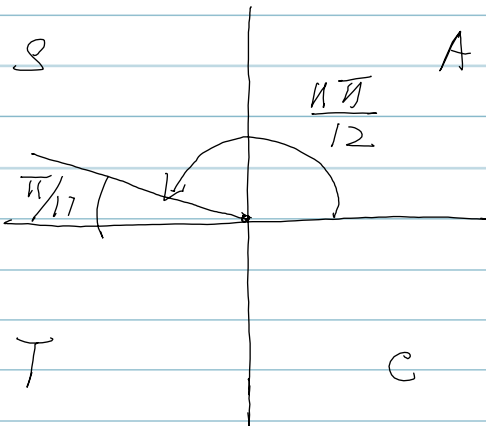
$$\Rightarrow x = \sqrt{\frac{2+\sqrt{3}}{4}}$$

(6b) $\tan\left(\frac{\pi}{12}\right) = \frac{\sin\left(\frac{\pi}{12}\right)}{\cos\left(\frac{\pi}{12}\right)}$

$$= \frac{\sqrt{\frac{2-\sqrt{3}}{4}}}{\sqrt{\frac{2+\sqrt{3}}{4}}} = \sqrt{\frac{\frac{2-\sqrt{3}}{4}}{\frac{2+\sqrt{3}}{4}}} = \sqrt{\frac{2-\sqrt{3}}{2+\sqrt{3}}}$$

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

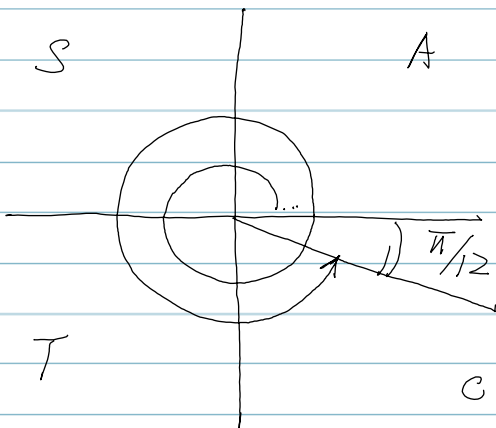
$$(6c) \quad \cos\left(\frac{11\pi}{12}\right) = -\cos\left(\frac{\pi}{12}\right) = -\sqrt{\frac{2+\sqrt{3}}{4}}$$



ref. angle = $\pi/12$

$$(6d) \quad \tan\left(\frac{47\pi}{12}\right) = -\tan\frac{\pi}{12} = -\sqrt{\frac{2-\sqrt{3}}{2+\sqrt{3}}}$$

$$\frac{48}{12} = 4$$



ref. angle = $\pi/12$