

#8

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

$$\cos\frac{\pi}{6} \cdot \cos x - \sin\frac{\pi}{6} \cdot \sin x$$

$$\begin{matrix} \parallel a & & \parallel b \\ \frac{\sqrt{3}}{2} & & \frac{1}{2} \end{matrix}$$

$$\frac{\sqrt{3}}{2} \cos x - \frac{\sin x}{2} = \frac{1}{2} = \cos\left(\frac{\pi}{6} + x\right)$$

$$\frac{\sqrt{3}}{2} \cos x - \frac{1}{2} \sin x = \cos\left(\frac{\pi}{6} + x\right)$$

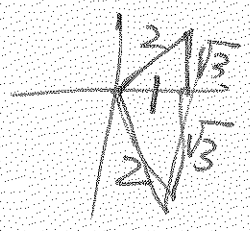
$$\cos\left(\frac{\pi}{6} + x\right) = \frac{1}{2} \quad [0, 2\pi]$$

$$\frac{\pi}{6} + x = \frac{1}{2}$$

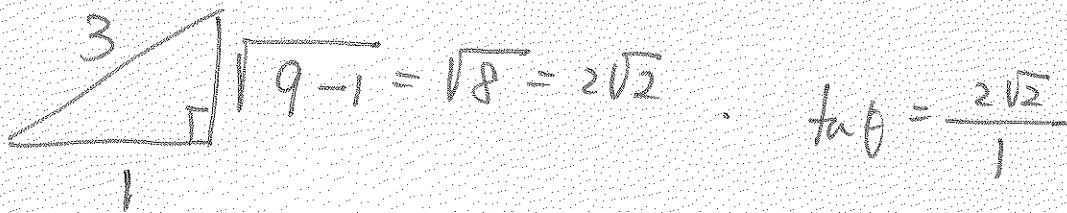
$$\left(\frac{\pi}{6} + x\right) = \frac{\pi}{3}, \frac{5\pi}{3}$$

$$x = \frac{\pi}{3} - \frac{\pi}{6}$$

$$x = \frac{5\pi}{3} - \frac{\pi}{6}$$



#9. $\cos\theta = \frac{1}{3}$ 1st Q.



$\tan\theta = \frac{2\sqrt{2}}{1}$

$\sin\theta = \frac{2\sqrt{2}}{3}$

$\tan 2\theta = \frac{2 \tan\theta}{1 - \tan^2\theta} = \frac{2(2\sqrt{2})}{1 - (2\sqrt{2})^2}$

$= \frac{4\sqrt{2}}{1 - 8} = \boxed{\frac{4\sqrt{2}}{7}}$

(c) $\cos\left(\frac{\theta}{2}\right)$

$\cos 2\theta = \frac{1}{2}(1 + \cos\theta)$

$\sin 2\theta = \frac{1}{2}(1 - \cos\theta)$

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

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

$= \frac{\sqrt{2}}{\sqrt{3}} = \frac{\sqrt{6}}{3}$

#11.

$$2(\sec^2 \theta) - 5 \sec \theta - 10 = 0$$

$$2(\sec^2 \theta - 1) - 5 \sec \theta - 10 = 0$$

$$2 \sec^2 \theta - 2 - 5 \sec \theta - 10 = 0$$

$$2 \sec^2 \theta - 5 \sec \theta - 12 = 0$$

$2 \sec \theta$	$+ 3$
$\sec \theta$	$- 4$

$$\frac{\pi}{2} < \theta \leq \pi$$

$$(2 \sec \theta + 3)(\sec \theta - 4) = 0$$

$\sec \theta = -\frac{3}{2}$ $\sec \theta = 4$

$$\hookrightarrow \cos \theta = -\frac{2}{3}$$

~~$$\cos \theta = \frac{1}{4}$$~~

$$\theta = \cos^{-1}\left(-\frac{2}{3}\right)$$