

$$1. \cos x = \frac{1}{-\sqrt{2}}$$

$$(a) \quad x = \cos^{-1}\left(\frac{1}{-\sqrt{2}}\right) \\ = -45^\circ$$

$$\text{for } 0 \leq x < 2\pi$$

Cosine is +ve in the 1st and 4th quadrant  
Cosine is -ve in the 2nd and 3rd quadrant

$$x = 135^\circ, 225^\circ$$

$$x = \frac{3}{4}\pi, \frac{5}{4}\pi$$

$$(b) \sqrt{3} \tan x = 1$$

$$\tan x = \frac{1}{\sqrt{3}}$$

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

$$x = 30^\circ$$

tangent is +ve in the  
1<sup>st</sup> and 3<sup>rd</sup> Quadrant

$$x = 30^\circ \text{ and } 210^\circ$$

$$= \frac{\pi}{6} \text{ , } \frac{7}{6}\pi$$

$$(4) \quad \cos x + \cos x = \sqrt{3}$$

$$2 \cos x = \sqrt{3}$$

$$\cos x = \frac{\sqrt{3}}{2}$$

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

$$= 30^\circ$$

Cosine is +ve in the

1<sup>st</sup> and 4<sup>th</sup> quadrant

$$x = 30^\circ, 330^\circ$$

$$= \frac{\pi}{6}, \frac{11\pi}{6}$$

$$(d) 2\sin^2 x = 1$$

$$\sin^2 x = \frac{1}{2}$$

$$\sin x = \pm \sqrt{\frac{1}{2}}$$

$$\sin x = \pm \frac{\sqrt{2}}{2}$$

$$\sin x = \frac{\sqrt{2}}{2}$$

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

$$x = 45^\circ$$

+ve in 1<sup>st</sup> and 2<sup>nd</sup> q<sup>ts</sup>

$$= 45^\circ, 135^\circ$$

$$= \frac{1}{4}\pi, \frac{3}{4}\pi$$

$$\sin x = -\frac{\sqrt{2}}{2}$$

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

$$x = 225^\circ, 315^\circ$$

$$= \frac{5}{4}\pi, \frac{7}{4}\pi$$