

37.

$$a) \underline{\underline{\sin \frac{\theta}{2}}}$$

tenemos que

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

↓

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

$$\boxed{\sin \frac{\theta}{2} = \pm \sqrt{\frac{1 - \cos \theta}{2}}}$$

$$b) \underline{\underline{\cos \frac{\theta}{2}}}$$

$$\cos^2 \theta = \frac{1 + \cos 2\theta}{2}$$

↓

$$\cos^2 \frac{\theta}{2} = \frac{1 + \cos \theta}{2}$$

$$\boxed{\cos \frac{\theta}{2} = \pm \sqrt{\frac{1 + \cos \theta}{2}}}$$

$$c) \tan \frac{\theta}{2} = \frac{\sin \frac{\theta}{2}}{\cos \frac{\theta}{2}} = \pm \frac{\sqrt{\frac{1 - \cos \theta}{2}}}{\sqrt{\frac{1 + \cos \theta}{2}}}$$

$$\boxed{\tan \frac{\theta}{2} = \pm \sqrt{\frac{1 - \cos \theta}{1 + \cos \theta}}}$$

$$38. \cos x = -\frac{12}{13}, x \in (\pi, \frac{3\pi}{2})$$

Usando el ejercicio 37 tenemos:

$$a) \sin \frac{x}{2} = \pm \sqrt{\frac{1 - \cos x}{2}}$$

$$\sin \frac{x}{2} = \pm \sqrt{\frac{1 - (-\frac{12}{13})}{2}}$$

$$\sin \frac{x}{2} = \pm \sqrt{\frac{25}{26}}$$

$$x \in (\pi, \frac{3\pi}{2}) \Rightarrow \frac{x}{2} \in (\frac{\pi}{2}, \frac{3\pi}{4})$$

$$\sin \frac{x}{2} > 0$$

$$\boxed{\sin \frac{x}{2} = \sqrt{\frac{25}{26}}}$$