38)

b) $\cos\frac{x}{2} = \pm\sqrt{\frac{1+\cos x}{2}}$

$= \pm\sqrt{\frac{1-\frac{12}{13}}{2}}$

$\cos\frac{x}{2} = \pm\frac{1}{\sqrt{26}}$; $\frac{x}{2} \in (\frac{\pi}{2}, \frac{3\pi}{4})$

$\rightarrow$ $\boxed{\cos\frac{x}{2} = -\frac{1}{\sqrt{26}}}$

c) $\operatorname{tg}\frac{x}{2} = \frac{\sin\frac{x}{2}}{\cos\frac{x}{2}} = \frac{\sqrt{\frac{25}{26}}}{\frac{-1}{\sqrt{26}}}$

$= -\sqrt{25}$

$\boxed{\operatorname{tg}\frac{x}{2} = -5}$

39.

$\operatorname{tg}\theta = \frac{\sin\theta}{\cos\theta}$ $\quad (\theta \neq (n+\frac{1}{2})\pi)$

$\therefore$ $\operatorname{tg} 2\theta = \frac{\sin 2\theta}{\cos 2\theta}$ $\quad (2\theta \neq (n+\frac{1}{2})\pi)$

$\frac{2\operatorname{tg}\theta}{1-\operatorname{tg}^2\theta} = \frac{\sin 2\theta}{\pm\sqrt{1-\sin^2 2\theta}}$

$\frac{4\operatorname{tg}^2\theta}{(1-\operatorname{tg}^2\theta)^2} = \frac{\sin^2 2\theta}{1-\sin^2 2\theta}$

$\frac{4\operatorname{tg}^2\theta}{(1-\operatorname{tg}^2\theta)^2}(1-\sin^2 2\theta) = \sin^2 2\theta$

$\frac{4\operatorname{tg}^2\theta}{(1-\operatorname{tg}^2\theta)^2} - \frac{4\operatorname{tg}^2\theta}{(1-\operatorname{tg}^2\theta)^2}\sin^2 2\theta - \sin^2 2\theta$

$\frac{4\operatorname{tg}^2\theta}{(1-\operatorname{tg}^2\theta)^2} = \sin^2 2\theta\left(1 + \frac{4\operatorname{tg}^2\theta}{(1-\operatorname{tg}^2\theta)^2}\right)$

$\frac{4\operatorname{tg}^2\theta}{(1-\operatorname{tg}^2\theta)^2} = \sin^2 2\theta\left(\frac{(1-\operatorname{tg}^2\theta)^2 + 4\operatorname{tg}^2\theta}{(1-\operatorname{tg}^2\theta)^2}\right)$

$4\operatorname{tg}^2\theta = \sin^2 2\theta(1 - 2\operatorname{tg}^2\theta + \operatorname{tg}^4\theta + 4\operatorname{tg}^2\theta)$

$= \sin^2 2\theta(1 + 2\operatorname{tg}^2\theta + \operatorname{tg}^4\theta)$

$4\operatorname{tg}^2\theta = \sin^2 2\theta(1+\operatorname{tg}^2\theta)^2$

$\therefore$ $\sin^2 2\theta = \frac{4\operatorname{tg}^2\theta}{(1+\operatorname{tg}^2\theta)^2}$

$\sin 2\theta = \pm\frac{2\operatorname{tg}\theta}{(1+\operatorname{tg}^2\theta)}$ (*)