

الف) $1 - 2\sin^2 x = 3\sin x - 1$
 $2\sin^2 x + 3\sin x - 2 = 0$
 $\sin x = \frac{1}{2} \checkmark \quad \sin x = -2 \text{ غلط}$
 $x = 2k\pi + \frac{\pi}{6}$
 $x = 2k\pi + \frac{5\pi}{6}$

ب) $2\cos^2 x - 1 + \cos x - 2 = 0$
 $2\cos^2 x + \cos x - 3 = 0$
 $\cos x = \frac{1}{2} \checkmark \quad \cos x = -\frac{3}{2} \text{ غلط}$
 $x = 2k\pi \pm \frac{\pi}{3}$

الف) $\sin^2 x - \cos^2 x = \sin^2 x$
 $(\sin^2 x - \cos^2 x)(\sin^2 x + \cos^2 x) = \sin^2 x$
 $-\cos^2 x = 2\sin^2 x \cdot \cos^2 x$
 $\sin^2 x = -\frac{1}{2}$
 $x = 2k\pi - \frac{\pi}{4}, 2k\pi + \frac{3\pi}{4}$

ب) $2\cos^2 x - 1 = -2\sin x \cdot \cos x$
 $\cos^2 x - \sin^2 x \stackrel{\div \cos^2 x}{=} -\tan^2 x = 1$
 $\tan^2 x = -1 \quad x = k\pi - \frac{\pi}{4}$
 $x = \frac{k\pi}{2} - \frac{\pi}{4}$

الف) $\frac{\cos x}{\sin x} (2\cos x + 1) = \frac{1}{\sin x}$
 $2\cos^2 x + \cos x = 1$
 $2\cos^2 x + \cos x - 1 = 0$
 $\cos x = -1 \checkmark \quad x = (2k+1)\pi$
 $\cos x = \frac{1}{2} \checkmark \quad x = 2k\pi \pm \frac{\pi}{3}$

ب) $\sin^2 x - \sin x \cdot \cos x + \sin^2 x + \frac{\cos^2 x - 1}{-\sin^2 x} - 1 = 0$
 $\frac{\sin^2 x - 1 - \sin x \cdot \cos x}{-\cos^2 x} = 0$
 $\cos x (\cos x - \sin x) = 0$
 $\cos x = 0 \quad x = 2k\pi \pm \frac{\pi}{2} \quad \cos x - \sin x = 0$
 $\cos x = \sin x$
 $x = k\pi + \frac{\pi}{4}$

الف) $\cos(\frac{\pi}{6} + x) \cdot \cos(\frac{\pi}{6} - x) = \frac{1}{4}$
 $\cos(\frac{\pi}{6} + x) \cdot \sin(\frac{\pi}{6} + x) = \frac{1}{4}$
 $\frac{1}{2} \sin(2x + \frac{\pi}{6}) = \frac{1}{4}$
 $\cos^2 x = \frac{1}{2} \quad x = 2k\pi \pm \frac{\pi}{4} \quad x = k\pi \pm \frac{\pi}{4}$

ب) $\cos(2x - \frac{\pi}{4}) = \sin(\frac{11\pi}{12} - 2x)$
 $-\sin(\frac{11\pi}{12} - 2x) = \sin 2x$
 $\sin(2x - \frac{11\pi}{12}) = \sin 2x$
 $2x = 2k\pi + 2x - \frac{11\pi}{12} \quad \times$
 $2x = 2k\pi + \pi - 2x + \frac{11\pi}{12} \quad x = \frac{k\pi}{2} + \frac{19\pi}{24}$

$\frac{2\sin^2 x \cdot \cos^2 x + \sin^2 x}{\sin^2 x} = \cos^2 x - \sin^2 x$

$2\cos^2 x + 1 = \cos^2 x$

$\cos^2 x = -1 \Rightarrow x = (2k+1)\pi \Rightarrow x = \frac{(2k+1)}{2} \pi$

۵ $\sin^2 x$ در $\frac{(2k+1)\pi}{2}$ مساوی صفری شود
 و متخرج را صفری کند
 پس معادله جواب ندارد

$$\frac{\sin \frac{x}{r}}{1 + \cos \frac{x}{r}} = \frac{1 + \cos \frac{x}{r}}{\sin \frac{x}{r}}$$

$$a = \frac{1}{a}$$

$$a = \pm 1$$

$$\frac{\sin \frac{x}{r}}{1 + \cos \frac{x}{r}} = 1$$

$$1 + \cos \frac{x}{r} = \sin \frac{x}{r}$$



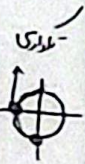
$$\sin \frac{x}{r} - \cos \frac{x}{r} = 1$$

$$\frac{x}{r} = 2k\pi + \frac{\pi}{r} \Rightarrow x = 2k\pi + \pi \quad \frac{x}{r} = \frac{(2k+1)\pi}{r} \Rightarrow x = (2k+1)\pi$$

$$\frac{\sin \frac{x}{r}}{1 + \cos \frac{x}{r}} = -1 \quad \sin \frac{x}{r} + \cos \frac{x}{r} = -1$$

$$\frac{x}{r} = 2k\pi - \frac{\pi}{r} \Rightarrow x = 2k\pi - \pi$$

$$- \pi, \pi : [-\pi, \frac{\pi}{r}] \text{ جواب در بازه } \pi - (-\pi) = 2\pi$$



$$-\sin^2 x \cdot \cos^2 x = \sin^2 x \Rightarrow \sin^2 x = 0 \quad x = k\pi$$

$$\hookrightarrow \cos^2 x = -1 \Rightarrow x = (2k+1)\pi \Rightarrow x = \frac{(2k+1)\pi}{r}$$

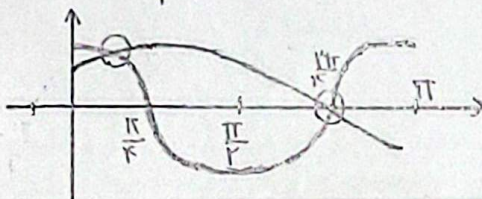
$$\text{جواب: } 0, \pi, 2\pi, \frac{\pi}{r}, \frac{2\pi}{r}$$

$$\frac{1 - \tan x}{1 + \tan x} = \tan(x - \frac{\pi}{r})$$

$$\tan(x - \frac{\pi}{r}) = \tan^2 x \Rightarrow x = k\pi + x - \frac{\pi}{r} \Rightarrow x = \frac{k\pi}{r} - \frac{\pi}{r}$$

$$\sqrt{1 + \sin^2 x} + \sqrt{(\sin x + \cos x)^2} = |\sin x + \cos x| = |\sqrt{2} \sin(x + \frac{\pi}{r})|$$

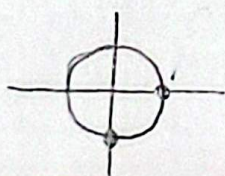
$$|\sqrt{2} \sin(x + \frac{\pi}{r})| = \sqrt{2} \cos^2 x \Rightarrow |\sin(x + \frac{\pi}{r})| = \cos^2 x$$



دو جواب

$$\text{الف) } -\cos^2 x = 1 \Rightarrow x = (2k+1)\pi \Rightarrow x = \frac{(2k+1)\pi}{r} \quad \frac{\pi}{r}, \frac{2\pi}{r}$$

$$\text{ب) } \sin^2 x - \cos^2 x = -1$$



$$\Rightarrow 0, 2\pi, \frac{2\pi}{r}$$