

الف) $\cos^2 x - \sin^2 x = 2 \sin x - 1 \rightarrow 2 \cos^2 x - 1 = 2 \sin x - 1$

$2 - 2 \sin^2 x + 2 \sin x = 0 \rightarrow \sin x = \frac{1}{2}$
 $\sin x = \frac{1}{2} \rightarrow x = 30^\circ$
 $x = k\pi + \frac{\pi}{6}$

ب) $\cos^2 x - \sin^2 x + \cos x - 2 = 0$

$2 \cos^2 x + \cos x - 2 = 0 \rightarrow \cos x = \frac{1}{2}$
 $\cos x = \frac{1}{2} \rightarrow x = 60^\circ$
 $x = 2k\pi$

$-\cos^2 x = \sin^2 x \rightarrow -\cos^2 x = 4 \sin^2 x \cos^2 x \rightarrow 2 \sin^2 x = -1$ (الف)

$\sin^2 x = -\frac{1}{2} \rightarrow x = 2k\pi + \frac{\sqrt{2}\pi}{2}, (2k+1)\pi - \frac{\pi}{2}$

$\cos^2 x + \sin^2 x = 0 \rightarrow \tan^2 x = -1$
 $x = 72.0^\circ, 107.1^\circ$
 $x = 2k\pi + \frac{12.0\pi}{17}, 2k\pi + \frac{21.0\pi}{17}$

$\frac{2 \cos^2 x}{\sin x} + \frac{\cos x}{\sin x} = \frac{1}{\sin x} \rightarrow 2 \cos^2 x + \cos x - 1 = 0$ (الف)

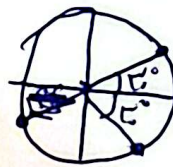
$x = 0, 2\pi, 4\pi \rightarrow x = (2k+1)\pi, 2k\pi \pm \frac{\pi}{2}$

$\sin^2 x - \sin x \cos x = 1 \rightarrow \tan^2 x - \tan x = 1 + \tan^2 x$

$\tan x = -1 \rightarrow x = 135^\circ, 225^\circ \rightarrow x = 2k\pi - \frac{\pi}{4}, 2k\pi + \frac{3\pi}{4}$

$\cos\left(\frac{\pi}{4} + x\right) \cos\left(x - \frac{\pi}{4}\right) = \frac{1}{2} (\cos^2 x + \cos^2 \frac{\pi}{4})$ (الف)

$\frac{1}{2} \cos^2 x = \frac{1}{2} \rightarrow \cos^2 x = \frac{1}{2}$



$x = 2k\pi + \frac{\pi}{4}$

$x = -\frac{\pi}{4} + k\pi$

ب) $\cos\left(\frac{x\pi}{4} - 2x\right) = \sin^2 x$
 $x = \frac{29\pi}{17} + \frac{k\pi}{4}$

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

~~$\cos^2 x + \cos^2 x + \sin^2 x - \sin^2 x = 0$~~

$1 + \cos^2 x = 1 \rightarrow 2 \cos^2 x = 0 \rightarrow 2 \cos^2 x - 2 \sin^2 x = 0$

$\cos^2 x = \sin^2 x \rightarrow x = 45^\circ, 135^\circ, 225^\circ, 315^\circ \rightarrow x = k\pi \pm \frac{\pi}{4}$

$$\frac{1 - \cos \frac{\pi}{r}}{\sin \frac{\pi}{r}} - \frac{1}{\sin \frac{\pi}{r}} = \frac{\cos \frac{\pi}{r}}{\sin \frac{\pi}{r}} \rightarrow r \cos \frac{\pi}{r} = 0 \rightarrow \cos \frac{\pi}{r} = 0$$

$$x = 110^\circ, 290^\circ, 470^\circ, \dots \rightarrow \left[-\pi, \frac{r\pi}{r}\right] \rightarrow -\pi, \pi$$

$$|\pi - (-\pi)| = \boxed{2\pi}$$

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


$$rx = 110^\circ, 290^\circ, 470^\circ, \dots \rightarrow \boxed{x = 60^\circ, 110^\circ, 170^\circ}$$

$$x = \frac{\pi}{r}, \pi, \frac{2\pi}{r} \rightarrow \boxed{\text{جواب 3}}$$

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

$$rx = \frac{\pi}{r} - x \rightarrow \frac{\pi}{r} - x = rx + k\pi \rightarrow \frac{\pi}{r} - rx = k\pi$$

$$\boxed{x = -\frac{\pi}{13} - \frac{k\pi}{r}}$$

$$\sqrt{1 + \sin^r x} = \sqrt{(\sin x + \cos x)^r} = \sin x + \cos x$$

$x + \frac{\pi}{r} = \pi - \left(\frac{\pi}{r} - rx\right)$ $\rightarrow$ $x = \frac{\pi}{r}$

$$\sin x + \cos x = \sqrt{r} (\cos^r x - \sin^r x) = \sqrt{r} (r \cos^r x - 1)$$

$$\sin x + \cos x = \sqrt{r} \cos^r x = \sqrt{r} \sin\left(x + \frac{\pi}{r}\right) \quad \boxed{x = \frac{\pi}{r}}$$

$$\sin\left(x + \frac{\pi}{r}\right) = \sin\left(\frac{\pi}{r} - rx\right) \rightarrow x + \frac{\pi}{r} = \frac{\pi}{r} - rx \quad \boxed{1 \text{ حل}}$$

$$-(\cos^r x - \sin^r x) = -\cos^r x = 1 \rightarrow \cos^r x = -1$$

$$\frac{\pi}{r} + \frac{\pi}{r} = x = \frac{\pi}{r}$$

$$\text{الحل 2: } \sin x = -1, \cos x = 0 \rightarrow x = \frac{3\pi}{2}$$

$$\text{الحل 3: } \sin x = 0, \cos x = 1 \rightarrow x = 0, 2\pi$$