

$$\text{الف) } 1 - Y \sin^2 n = Y \sin^2 n - 1 \rightarrow Y \sin^2 n + Y \sin^2 n - Y = 0 \rightarrow \sin^2 n = \frac{Y \pm 0}{Y} \rightarrow \begin{cases} \frac{1}{Y} \\ -\frac{1}{Y} \end{cases} \quad (1)$$

$$\sin n = \frac{1}{Y} \Rightarrow \sin n = \sin \frac{\pi}{Y} \Rightarrow \begin{cases} n = Yk\pi + \frac{\pi}{Y} \\ n = Yk\pi + \frac{3\pi}{Y} \end{cases}$$

$$\Rightarrow Y \cos^2 n + \cos n - Y = 0 \rightarrow \cos^2 n = \frac{Y}{Y} \rightarrow \cos n = 1 \rightarrow \cos n = \cos Yk\pi \rightarrow \boxed{n = Yk\pi}$$

$$\text{الف) } -\cos^2 n = Y \sin^2 n \cos^2 n \rightarrow \cos^2 n = 0 \rightarrow Yn = k\pi + \frac{\pi}{2} \rightarrow \boxed{n = \frac{k\pi}{Y} + \frac{\pi}{Y}} \quad (2)$$

$$\rightarrow \sin^2 n = \frac{1}{Y} \rightarrow Yn = Yk\pi + \frac{\pi}{Y} \rightarrow \boxed{n = k\pi + \frac{\pi}{Y}}$$

$$\rightarrow Yn = Yk\pi - \frac{\pi}{Y} \rightarrow \boxed{n = k\pi - \frac{\pi}{Y}}$$

$$\text{ب) } \sin^2 n = -\cos^2 n \rightarrow \sin^2 n = \sin^2 \left(\frac{Yn}{Y} - \frac{\pi}{Y} \right) \rightarrow Yn = Yk\pi + \frac{\pi}{Y} \rightarrow \boxed{n = \frac{k\pi}{Y} + \frac{\pi}{Y}}$$

$$\rightarrow Yn = Yk\pi + \frac{\pi}{Y} - \frac{\pi}{Y} + Yn \rightarrow \text{جواب ندارد}$$

$$\text{الف) } \frac{\cos n}{\sin n} (Y \cos n + 1) = \frac{1}{\sin n} \xrightarrow{\times \sin n} Y \cos^2 n + \cos n - 1 = 0 \rightarrow \quad (3)$$

$$\cos n = \frac{1}{Y} \rightarrow \boxed{n = Yk\pi + \frac{\pi}{Y}}$$

$$\cos n = -1 \rightarrow \sin n = 0 \rightarrow \text{جواب ندارد}$$

$$\Rightarrow Y - Y \cos^2 n - \sin n \cos n + \cos^2 n = Y \rightarrow \cos^2 n + \sin n \cos n = 0 \rightarrow \cos n (\cos n + \sin n) = 0 \rightarrow$$

$$\cos n = 0 \rightarrow \boxed{n = k\pi + \frac{\pi}{2}}$$

$$\cos n = -\sin n \rightarrow \boxed{n = k\pi + \frac{3\pi}{4}}$$

$$\text{الف) } \cos\left(\frac{\pi}{r} + n\right) \times \underbrace{\sin\left(\frac{\pi}{r} + (n - \frac{\pi}{r})\right)}_{\sin(n + \frac{\pi}{r})} = \frac{1}{r} \rightarrow \frac{1}{r} \sin(n + \frac{\pi}{r}) = \frac{1}{r} \rightarrow \sin(n + \frac{\pi}{r}) = \frac{1}{r} \quad (5)$$

$$\rightarrow \cos n = \frac{1}{r} \rightarrow n = k\pi \pm \frac{\pi}{r} \rightarrow \boxed{n = k\pi \pm \frac{\pi}{r}}$$

$$\text{ب) } \cos\left(n - \frac{\pi}{r}\right) = \cos\left(\frac{\pi}{r} + n\right) \rightarrow n - \frac{\pi}{r} = k\pi \pm \left(\frac{\pi}{r} + n\right) \rightarrow$$

$$n - \frac{\pi}{r} = k\pi - \frac{\pi}{r} - n \rightarrow n = k\pi + \frac{\pi}{r} - \frac{\pi}{r} = k\pi - \frac{\pi}{r} \rightarrow \boxed{n = \frac{k\pi}{r} - \frac{\pi}{r}}$$

$$\sin n = 0 \rightarrow \sin n \cos n = 0 \xrightarrow{\sin n \neq 0} \cos n = 0 \rightarrow n = k\pi + \frac{\pi}{r} \rightarrow (3)$$

$$\boxed{n = \frac{k\pi}{r} + \frac{\pi}{r}}$$

(4)

$$\left(\sin \frac{n}{r}\right)^r = (1 + \cos \frac{n}{r})^r \rightarrow \sin \frac{n}{r} = \cos \frac{n}{r} + 1 \rightarrow r \cos \frac{n}{r} + \cos \frac{n}{r} = 0 \rightarrow$$

$$\cos \frac{n}{r} = 0 \rightarrow \frac{n}{r} = k\pi + \frac{\pi}{r} \rightarrow n = k\pi + \pi \rightarrow n = -\pi, \pi, \dots \rightarrow |\pi - (-\pi)| = 2\pi$$

$$\cos \frac{n}{r} = -1 \rightarrow \sin \frac{n}{r} = 0 \rightarrow \text{X}$$

(5)

$$-\sin n (1 + \cos n) = 0 \rightarrow \cos n = -1 \rightarrow n = k\pi + \pi \rightarrow n = \frac{k\pi}{r} + \frac{\pi}{r} \rightarrow n = \frac{\pi}{r}, \frac{3\pi}{r}, \dots$$

$$\rightarrow \sin n = 0 \rightarrow n = k\pi \rightarrow n = 0, \pi, 2\pi, \dots$$

$$\rightarrow n = 0, \frac{\pi}{r}, \pi, \frac{3\pi}{r}, 2\pi \rightarrow \boxed{\text{جواب}}$$

$$\tan\left(\frac{\pi}{r} - n\right) = \tan n \rightarrow n = k\pi + \frac{\pi}{r} - n \rightarrow \boxed{n = \frac{k\pi}{r} + \frac{\pi}{r}}$$

(6)

