

19 و 20

Answer

14

19 و 20

$$\text{جواب 1) } \cos^2 \alpha = \sin^2 \alpha - 1 = 2 \sin^2 \alpha - \sin^2 \alpha = \sin^2 \alpha - 1$$

$$\Rightarrow \sin^2 \alpha + \sin^2 \alpha - 2 = 0 \quad \xrightarrow{\cos^2 \alpha} \sin^2 \alpha + \sin^2 \alpha - 2 = 0$$

$$\Rightarrow \sin^2 \alpha + \sin^2 \alpha - 2 = 0 \quad \xrightarrow{(\sin^2 \alpha + 1)(\sin^2 \alpha - 1)} \quad \sin^2 \alpha - 1 = 0$$

$$\Rightarrow \alpha = \frac{\pi}{4} \quad \text{و} \quad \alpha = \frac{3\pi}{4}$$

$$\text{جواب 2) } \cos^2 \alpha + \cos^2 \alpha - 2 = 0 \Rightarrow \cos^2 \alpha = (1 - \cos^2 \alpha) + \cos^2 \alpha - 2 = 0$$

$$\Rightarrow \cos^2 \alpha + \cos^2 \alpha - 2 = 0 \Rightarrow \cos^2 \alpha = -\frac{1}{2} \quad \text{و} \quad \cos^2 \alpha = 1$$

$$\Rightarrow \alpha = \frac{\pi}{2}$$

$$\text{جواب 3) } \sin^2 \alpha = \cos^2 \alpha \Rightarrow \sin^2 \alpha = 1 - \sin^2 \alpha \Rightarrow \cos^2 \alpha = 1$$

$$\Rightarrow \sin^2 \alpha = 1 \Rightarrow \sin \alpha = \pm 1 \Rightarrow \alpha = \frac{\pi}{2} \text{ و } \alpha = \frac{3\pi}{2}$$

$$\Rightarrow \frac{\pi}{2} \text{ و } \alpha = \frac{3\pi}{2}$$

$$\cos^2 \alpha (1 + \sin^2 \alpha) = 0$$

$$\cos^2 \alpha = 0 \Rightarrow \alpha = \frac{\pi}{2} \text{ و } \alpha = \frac{3\pi}{2}$$

$$\sin^2 \alpha = 1 \Rightarrow \alpha = \frac{\pi}{2} \text{ و } \alpha = \frac{3\pi}{2}$$

$$\alpha = \frac{\pi}{2} \text{ و } \alpha = \frac{3\pi}{2}$$

$$\text{جواب 4) } \cos^2 \alpha + \sin^2 \alpha = 1 \Rightarrow \cos^2 \alpha + \sin^2 \alpha = 1$$

$$\Rightarrow \tan^2 \alpha = 1 \Rightarrow \tan \alpha = 1 \Rightarrow \alpha = k\pi - \frac{\pi}{4} \quad \text{و} \quad \alpha = k\pi - \frac{\pi}{4}$$

$$\text{ب) } \cos(\alpha) = \sin \alpha^{-1} \Rightarrow \cos^2 \alpha + \sin^2 \alpha = 1 \Rightarrow 1 = 1$$

$$\Rightarrow \cos^2 \alpha + \sin^2 \alpha = 1 \Rightarrow \cos^2 \alpha = 1 \Rightarrow \cos \alpha = \pm 1 \Rightarrow \alpha = k\pi$$

$$\Rightarrow \alpha = k\pi, \quad \alpha = k\pi + \frac{\pi}{2}, \quad \alpha = k\pi - \frac{\pi}{2}$$

$$\Rightarrow \sin^2 \alpha + \cos^2 \alpha = 1 \Rightarrow \sin^2 \alpha = 1 \Rightarrow \sin \alpha = \pm 1 \Rightarrow \alpha = k\pi + \frac{\pi}{2}$$

$$\sin \alpha \cos \alpha = \cos^2 \alpha \Rightarrow \cos \alpha = \sin \alpha \Rightarrow \cos \alpha = \sin(\alpha + \frac{\pi}{2})$$

$$\Rightarrow \frac{\pi}{2} + \alpha = k\pi - \alpha \Rightarrow \alpha = k\pi - \frac{\pi}{4}$$

$$\text{ب) } \cos(\frac{\pi}{4} + \alpha) \cos(\alpha - \frac{\pi}{4}) = \frac{1}{2} \Rightarrow \cos(\frac{\pi}{4} + \alpha) = \frac{1}{2}$$

$$\sin(\frac{\pi}{4} + \alpha) = \frac{1}{2} \Rightarrow \sin(\alpha + \frac{\pi}{4}) = \frac{1}{2} \Rightarrow \alpha = k\pi + \frac{\pi}{6}$$

$$\Rightarrow \alpha = k\pi \pm \frac{\pi}{4} \Rightarrow \alpha = k\pi \pm \frac{\pi}{4}$$

$$\Rightarrow \cos(\alpha - \frac{\pi}{4}) = \sin \alpha \Rightarrow \cos(\alpha - \frac{\pi}{4}) = \cos(\frac{\pi}{4} + \alpha)$$

$$\Rightarrow \alpha - \frac{\pi}{4} = k\pi + \frac{\pi}{4} + \alpha \Rightarrow \alpha = k\pi + \frac{N\pi}{2}$$

$$\Rightarrow \alpha = \frac{k\pi}{2} + \frac{N\pi}{2}$$

$$\frac{\sin 4x + \sin 2x}{\sin x} = \frac{\sin^2 x \cos^2 x + \sin^2 x}{\sin x} = \frac{\sin^2 x (\cos^2 x + 1)}{\sin x} = 1 \quad (1,0)$$

$$\Rightarrow \cos 2x = 0 \Rightarrow x = k\pi \pm \frac{\pi}{2} \Rightarrow x = \frac{k\pi}{2} \pm \frac{\pi}{2}$$

$$\frac{1}{\sin \frac{\pi}{r}} + \cot \frac{\pi}{r} \Rightarrow \frac{\sin \frac{\pi}{r}}{1 + \cos \frac{\pi}{r}} = \frac{1 + \cos \frac{\pi}{r}}{\sin \frac{\pi}{r}} \Rightarrow -4 \quad (1,0)$$

$$\tan \frac{\pi}{r} = \cot \frac{\pi}{r} \Rightarrow \tan \frac{\pi}{r} = \pm 1 \Rightarrow \frac{\pi}{r} = k\pi \pm \frac{\pi}{4}$$

$$x = k\pi + \pi, \frac{\pi}{2} \Rightarrow x = k\pi - \pi \quad \frac{\pi}{2} \Rightarrow \pi, -\pi \quad |\pi + \pi| = k\pi$$

$$\cos^2 x - \sin^2 x \cos^2 x = 1, \cos^2 x = 1 \Rightarrow x = k\pi \quad (1)$$

$$\Rightarrow x = \frac{\pi}{r} k\pi \pm \frac{\pi}{r} \Rightarrow \text{ob } \pi, \frac{\pi}{2} \quad \text{ob } \frac{\pi}{2} \Rightarrow \frac{\pi}{2}$$

$$\frac{1 + \tan x}{1 - \tan x}, \tan^2 x \Rightarrow \tan\left(\frac{\pi}{4} - x\right) \cdot \tan^2 x \Rightarrow x = k\pi + \frac{\pi}{4} \quad \text{ob } \frac{\pi}{4} \Rightarrow \frac{\pi}{4}$$

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

$$\cos x = 0 \Rightarrow x = k\pi \pm \frac{\pi}{2} \quad \cos^2 x = 1 \Rightarrow x = k\pi \pm \frac{\pi}{2}$$

$$\tan x = -1 \Rightarrow x = k\pi + \frac{3\pi}{4}$$

$$\tan\left(\frac{\pi}{4} - x\right) = \tan^2 x \Rightarrow \frac{\pi}{4} - x = k\pi + \frac{\pi}{4} \Rightarrow x = \frac{k\pi}{4} + \frac{\pi}{4}$$

$$\sqrt{\cos^2 x} \Rightarrow \sqrt{1 - \sin^2 x} \Rightarrow \pm \sin x \cdot \cos x \Rightarrow \pm \sin x$$

110

$$\Rightarrow \cos\left(\frac{\pi}{2} - x\right) = \sin x \Rightarrow \cos\left(x - \frac{\pi}{2}\right) = \sin x$$

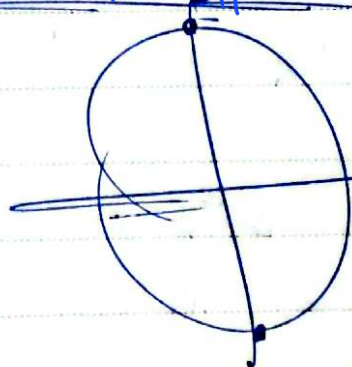
$$\Rightarrow x - \frac{\pi}{2} = k\pi + m \Rightarrow x = k\pi + \frac{\pi}{2} + m$$

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

$$\sin x = -1 \Rightarrow x = k\pi - \frac{\pi}{2} \Rightarrow \frac{3\pi}{2}$$

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

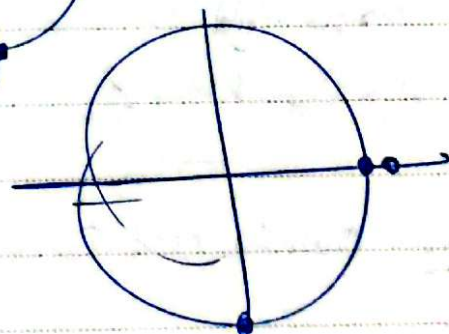
$$\cos x = 1 \Rightarrow x = k\pi$$



$$\frac{\pi}{2}, \frac{3\pi}{2}$$

5

$$\sin x = -1 \Rightarrow x = \frac{3\pi}{2}$$



$$\frac{\pi}{2}, \frac{3\pi}{2}$$