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نام خانوادگی: ... آریس بی بی نولادگیل پاسخنامه تشریحی تکلیف شماره 16 ... کلاس: ... دبیر: A

$$\text{الف) } \cos 2\alpha = 2\sin^2 \alpha - 1 \rightarrow 1 - 2\sin^2 \alpha = 2\sin^2 \alpha - 1 \rightarrow 2\sin^2 \alpha + 1\sin^2 \alpha = 2$$

$$\rightarrow \sin^2 \alpha + 2\sin^2 \alpha = 2 \rightarrow (\sin^2 \alpha + 2)(\sin^2 \alpha - 1) = 0 \rightarrow \sin^2 \alpha = \frac{1}{3} \checkmark \rightarrow \sin \alpha = \frac{1}{\sqrt{3}}$$

$$\rightarrow \left(x = \frac{1}{\sqrt{3}} \right) \frac{a}{x} + \frac{a}{x} \quad , \quad \left(x = \frac{1}{\sqrt{3}} \right) \frac{a}{x} + \frac{a}{x} \quad \rightarrow \sin 2\alpha = \frac{2}{3} \checkmark$$

$$\text{ب) } \cos 2\alpha = 2\cos^2 \alpha - 1 \rightarrow 2\cos^2 \alpha + \cos^2 \alpha = 2 \rightarrow \cos^2 \alpha + \cos^2 \alpha = 2$$

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

$$\text{الف) } \sin^2 \alpha - \cos^2 \alpha = \sin 2\alpha \rightarrow -\cos 2\alpha = \sin 2\alpha \rightarrow \sin 2\alpha = \sin(\frac{\pi}{2} + 2\alpha)$$

$$\frac{\pi}{2} + 2\alpha = \frac{\pi}{2} + 2\alpha \quad , \quad \frac{\pi}{2} + 2\alpha = \frac{\pi}{2} + 2\alpha \quad \rightarrow \alpha = \frac{\pi}{4}$$

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

$$\alpha = \frac{\pi}{4}$$

$$\cos 2\alpha = 0 \rightarrow \alpha = \frac{\pi}{4}$$

$$\sin 2\alpha = \frac{1}{2} \rightarrow \alpha = \frac{\pi}{6}, \alpha = \frac{\pi}{3}$$

$$\text{الف) } \cot \alpha (2\cos \alpha + 1) = \frac{1}{\sin \alpha} \Rightarrow \frac{\cos \alpha}{\sin \alpha} (2\cos \alpha + 1) = \frac{1}{\sin \alpha} \rightarrow \sin \alpha \neq 0$$

$$2\cos^2 \alpha + \cos \alpha = 1 \rightarrow 2\cos^2 \alpha - 1 = \cos \alpha \rightarrow \cos 2\alpha = \cos(\alpha - \frac{\pi}{2})$$

$$\rightarrow \alpha = \frac{\pi}{4}$$

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

$$\cot^2 \alpha = \cot^2 \alpha \rightarrow \cot \alpha (\cot \alpha + 1) = 1 \rightarrow \cot \alpha = 1 \rightarrow \alpha = \frac{\pi}{4}$$

$$\text{الف) } \cos(\frac{\pi}{2} + \alpha) \cos(\frac{\pi}{2} - \alpha) = \frac{1}{2} \rightarrow \cos \alpha \sin \alpha = \frac{1}{2} \rightarrow \sin 2\alpha = 1 \rightarrow 2\alpha = \frac{\pi}{2} \rightarrow \alpha = \frac{\pi}{4}$$

$$\text{ب) } \cos(\frac{\pi}{2} + \alpha) \sin(\frac{\pi}{2} - \alpha) = \frac{1}{2} \rightarrow -\sin \alpha \cos \alpha = \frac{1}{2} \rightarrow \sin 2\alpha = -1 \rightarrow 2\alpha = \frac{3\pi}{2} \rightarrow \alpha = \frac{3\pi}{4}$$

$$\text{الف) } \cos(\frac{\pi}{2} - \alpha) = -\sin \alpha \rightarrow \cos(\frac{\pi}{2} - \alpha) = \cos(\frac{\pi}{2} + \alpha)$$

$$\frac{\pi}{2} - \alpha = \frac{\pi}{2} + \alpha \rightarrow \alpha = 0$$

$$\frac{\pi}{2} - \alpha = \frac{\pi}{2} + \alpha \rightarrow \alpha = 0$$

$$\frac{\sin 2\alpha + \sin 2\alpha}{\sin 2\alpha} = \sin^2 \alpha = \cos^2 \alpha \rightarrow \sin^2 \alpha = \cos^2 \alpha \rightarrow \sin \alpha = \cos \alpha \rightarrow \alpha = \frac{\pi}{4}$$

$$2\cos^2 \alpha + \sin^2 \alpha = \cos^2 \alpha + \sin^2 \alpha \rightarrow \cos^2 \alpha = 0 \rightarrow \alpha = \frac{\pi}{2}$$

$$\alpha = \frac{\pi}{4}$$

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$$\frac{\sin \frac{a}{c}}{1 + \cos \frac{a}{c}} = \frac{1}{\sin \frac{a}{c}} \cdot \frac{\cos \frac{a}{c}}{\sin \frac{a}{c}} \rightarrow \tan \frac{a}{c} = \frac{\cos \frac{a}{c} + 1}{\sin \frac{a}{c}} \rightarrow \frac{\sin \frac{a}{c}}{\cos \frac{a}{c}} = \frac{\cos \frac{a}{c} + 1}{\sin \frac{a}{c}} \quad (7)$$

$$\sin \frac{a}{c} \sin \frac{a}{c} - \cos \frac{a}{c} \cos \frac{a}{c} = \cos \frac{a}{c} \rightarrow \cos(\frac{a}{c}) = -\cos \frac{a}{c} \rightarrow \cos(\frac{a}{c}) = -\cos(\frac{a}{c}) \quad (5)$$

$$\cos \frac{a}{c} = -\cos(\frac{a}{c}) \rightarrow \cos \frac{a}{c} = \cos(\pi - \frac{a}{c}) \rightarrow \frac{a}{c} = \pi - \frac{a}{c} \rightarrow \frac{2a}{c} = \pi \rightarrow a = \frac{\pi c}{2}$$

$$\cos \frac{a}{c} - \sin \frac{a}{c} \cos \frac{a}{c} = 1 \rightarrow \sin \frac{a}{c} = -\sin \frac{a}{c} \cos \frac{a}{c} \rightarrow \sin \frac{a}{c} = 0 \rightarrow \frac{a}{c} = 0 \rightarrow a = 0$$

$$\sin \frac{a}{c} - \sin \frac{a}{c} \cos \frac{a}{c} = 1$$

$$\sin \frac{a}{c} = 1 \rightarrow \frac{a}{c} = \frac{\pi}{2} \rightarrow a = \frac{\pi c}{2}$$

$$\frac{1 - \tan \frac{a}{c}}{1 + \tan \frac{a}{c}} = \tan(\frac{a}{c} - \frac{\pi}{4}) = \tan \frac{a}{c} \rightarrow \frac{a}{c} = \frac{\pi}{4} \rightarrow a = \frac{\pi c}{4}$$

$$\sin \frac{a}{c} = -1 \rightarrow \frac{a}{c} = \frac{3\pi}{2} \rightarrow a = \frac{3\pi c}{2}$$

$$\frac{a}{c} = \frac{\pi}{2} \rightarrow a = \frac{\pi c}{2}$$

$$\sqrt{1 + \sin \frac{a}{c}} = \sqrt{2} \cos \frac{a}{c} \rightarrow 1 + \sin \frac{a}{c} = 2 \cos^2 \frac{a}{c} \rightarrow \cos \frac{a}{c} = \pm \sqrt{\frac{1 + \sin \frac{a}{c}}{2}}$$

$$\sin \frac{a}{c} = \cos \frac{a}{c} \rightarrow \cos(\frac{a}{c} - \frac{a}{c}) = \cos \frac{a}{c} \rightarrow \frac{a}{c} = \frac{a}{c} \rightarrow a = \frac{a}{c} \rightarrow a = \frac{a}{c}$$

$$\frac{a}{c} = \frac{a}{c} \rightarrow a = \frac{a}{c} \rightarrow a = \frac{a}{c}$$

$$\frac{a}{c} = \frac{a}{c} \rightarrow a = \frac{a}{c} \rightarrow a = \frac{a}{c}$$

$$\sin \frac{a}{c} - \cos \frac{a}{c} = 1 \rightarrow -\cos \frac{a}{c} \rightarrow \cos \frac{a}{c} = -1 \rightarrow \frac{a}{c} = \pi \rightarrow a = \pi c$$

$$\frac{a}{c} = \pi \rightarrow a = \pi c$$

$$\sin \frac{a}{c} - \cos \frac{a}{c} = -1 \rightarrow \sin \frac{a}{c} = \cos \frac{a}{c} - 1 \rightarrow \sin \frac{a}{c} = \cos \frac{a}{c} - 1$$



$$\frac{a}{c} = \frac{3\pi}{2} \rightarrow a = \frac{3\pi c}{2}$$

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