

1) الف)  $20^\circ = (2\pi) \text{ rad}$

$$\frac{2}{360} \times \frac{360^\circ}{1^\circ} = \frac{2\pi}{\pi}$$

$$2\pi = \frac{2\pi}{1} \text{ rad}$$

این است که در محاسبه، ادیان است.

ب)  $18^\circ = (\pi) \text{ rad}$

$$\frac{18}{360} \times \frac{360^\circ}{1^\circ} = \frac{\pi}{\pi}$$

$$2\pi = \frac{2\pi}{1} \text{ rad}$$

1, 2

ج)  $\frac{2\pi}{12} \text{ rad} = (2\pi)^\circ$

$$\frac{2\pi}{12} = \frac{2\pi}{12} \rightarrow 2\pi^\circ$$

د)  $\frac{4\pi}{9} \text{ rad} = (2\pi)^\circ$

$$\frac{4\pi}{9} = \frac{4\pi}{9} \rightarrow 4\pi^\circ$$

2) 10a

$$\frac{12\Delta a}{9} = \frac{12\Delta a}{9} \rightarrow \frac{12\Delta a}{9} = 12\Delta a$$

$$\frac{12\Delta a}{9} + \frac{12\Delta a}{9} + \frac{12\Delta a}{9} = 12\Delta a$$

$$f\Delta a = 12\Delta a$$

$$a = 12^\circ$$

3) الف)  $\cos 4^\circ \cos 2^\circ - \sin 4^\circ \sin 2^\circ - \tan 4^\circ + \tan 2^\circ = \tan 4^\circ = 1$

$$\tan 4^\circ = \tan 2^\circ = 1$$

$$\frac{\tan 4^\circ + \tan 2^\circ + \tan 4^\circ}{\cot 4^\circ - \cot 2^\circ} = \frac{1}{1} + 1 + 1 = \frac{12}{1} = 12$$

$$\tan 4^\circ = \cot 2^\circ = \frac{1}{\sqrt{2}}$$

$$\tan 2^\circ = \cot 4^\circ = \frac{1}{\sqrt{2}}$$

$$\tan 4^\circ = 1$$

1, 2

$$1) \sin^2 45^\circ \cos 45^\circ + \cos^2 45^\circ \sin 45^\circ = \sin^2 \theta$$

$$-\frac{1}{4} \times \frac{1}{4} \times \frac{1}{4} + \frac{\sqrt{2}}{2} \times \frac{\sqrt{2}}{2} = \sin^2 \theta$$

$$-\frac{1}{4} + \frac{1}{2} = \frac{1}{4} = \sin^2 \theta$$

$$\frac{1}{4} = \sin^2 \theta \Rightarrow r = \frac{1}{\sin \theta} = 1 + \cot^2 \theta \Rightarrow \cot^2 \theta = 1$$

$$\cot^2 \theta = 1 \Rightarrow \cot \theta = \pm 1 \Rightarrow \theta = 45^\circ$$

(P) ✓



$$\tan \theta = \pm 1 \Rightarrow \theta = 45^\circ$$

$$2) \frac{r \tan^2 45^\circ (1 - \tan^2 45^\circ)}{(1 - \cot^2 45^\circ)^2} = \tan \theta$$

$$\downarrow \tan^2 45^\circ$$

$$(1 - \tan^2 45^\circ)$$

$$\frac{r \tan^2 45^\circ}{1 - \tan^2 45^\circ} = \frac{r \times \frac{1}{4}}{1 - \frac{1}{4}} = \frac{\frac{r}{4}}{\frac{3}{4}} = \frac{r}{3} = \frac{r \times \sqrt{2}}{\sqrt{2} \times 3} = \frac{r \sqrt{2}}{3}$$

$$\frac{1}{4} = \frac{r}{3} \Rightarrow r = \frac{3}{4} \Rightarrow \theta = 45^\circ$$

(P) ✓

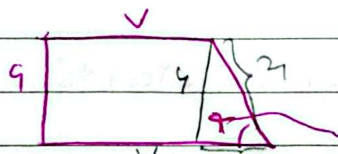
$$3) \tan \theta = 2$$

$$\frac{r \sin \theta - \cos \theta}{\sin \theta - r \cos \theta}$$

$$\frac{\sin \theta}{\cos \theta} = 2 \Rightarrow \frac{1 \cos \theta - \cos \theta}{\cos \theta} = \frac{1 \cos \theta}{\cos \theta} = 1$$

(P) ✓

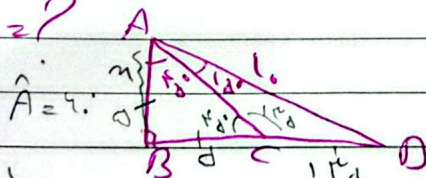
$$4) \sin \alpha = \frac{4}{5}$$



$$4 + 3 + 3 + 1 + 1 = 12 \Rightarrow \sin \alpha = \frac{4}{5} = \frac{4}{5}$$

(P) ✓

$$5) DC = ?$$



$$\sin 45^\circ = \frac{1}{\sqrt{2}}$$

$$m = 2 \Rightarrow n = 1$$

$$\hat{D} = 45^\circ$$

$$BD = \sqrt{2}$$

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$$AD + CD = \sqrt{2}$$

$$CD = \sqrt{2} - \sqrt{2}$$

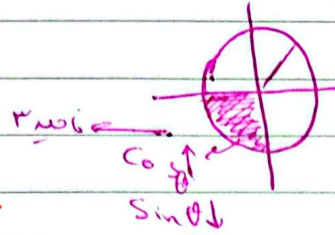
$$CD = \sqrt{2}(\sqrt{2} - 1)$$

Parsian

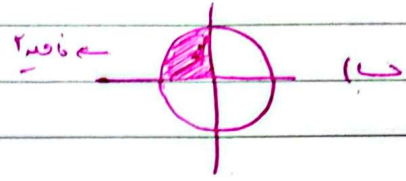
(P) ✓



9)



الف)



(2) ✓

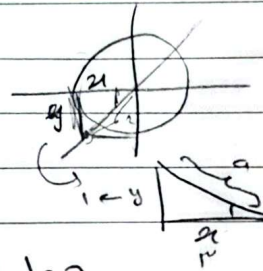
10)  $\tan x = \frac{1}{3}$

$\tan x \rightarrow \tan x \text{ and } \cot x \rightarrow \oplus$

$\sin x = ? \rightarrow$  مستقیم

$$\tan x = \frac{\sin x}{\cos x} = \frac{1}{3}$$

$$\frac{y}{x} = \frac{1}{3}$$



(1, 3)

$$1^2 + 9 = 10 \rightarrow \sqrt{10} = a$$

و در این سیستم است پس سینوس مستقیم است.

$$\sin x = \frac{y}{a} = \frac{1}{\sqrt{10}}$$