

نام و نام خانوادگی

پاسخنامه تشریحی تکلیف شماره ۱۰۰ کلاس

$$\frac{D}{180} = \frac{G}{360} = \frac{\text{rad}}{\pi} \rightarrow \text{ا) } \frac{270}{180} = \frac{a_1 \text{ rad}}{\pi} \rightarrow a_1 = \frac{3\pi}{2} \text{ rad}$$

$$\text{ب) } \frac{1480}{180} = \frac{a_1 \text{ rad}}{\pi} \rightarrow a_1 = \frac{25\pi}{9} \text{ rad} \quad \text{ج) } \frac{5\pi}{18} = \frac{a_1}{180} \rightarrow a_1 = 780$$

$$\text{د) } \frac{4\pi}{9} = \frac{a_1}{180} \rightarrow a_1 = 100$$

✓

$$\left(0 \xrightarrow{\times \frac{\pi}{180}} \text{rad} : \text{الیه} \right)$$

$$\begin{cases} 10a^\circ \\ \frac{148a}{9} G = 0 \rightarrow \frac{148a}{9} = \frac{0}{180} \rightarrow D = \frac{25a}{9} \\ \frac{a\pi}{18} \text{ rad} = 0 \rightarrow \frac{a\pi}{18} = \frac{0}{180} \rightarrow D = \frac{48a}{9} \end{cases} \quad \left(\frac{D}{180} = \frac{G}{360} = \frac{\text{rad}}{\pi} \right)$$

$$\begin{aligned} \text{جمع زوایای داخلی} &\Rightarrow 10a^\circ + \frac{25a}{9} + \frac{48a}{9} = 180 \\ &\Rightarrow \frac{90a}{9} = 180 \\ &\Rightarrow a = 180 \end{aligned}$$

✓

$$\text{دوازدهم سینوس (ب) } \rightarrow \text{ا) } \underbrace{\cos 40^\circ \cos 30^\circ - \sin 40^\circ \sin 30^\circ}_{\sin 70^\circ} - \tan 40^\circ + 2 \cos 40^\circ = 0 - 1 + 2 = 1$$

$$(\tan 70^\circ = \cot 20^\circ = 1)$$

$$\text{ب) } \frac{\left(\frac{\sqrt{3}}{3}\right)^2 + (1)^2 + (\sqrt{3})^2}{\sqrt{3} - \frac{\sqrt{3}}{3}} = \frac{\frac{1}{3} + 1 + 3}{\frac{2\sqrt{3}}{3}} = \frac{13}{2\sqrt{3}} = \frac{13\sqrt{3}}{6}$$

✓

$$-\left(\frac{1}{\sqrt{2}}\right) \times \left(\frac{1}{\sqrt{2}}\right) + \left(\frac{\sqrt{3}}{2}\right) \left(\frac{\sqrt{3}}{2}\right) = -\frac{1}{2} + \frac{3}{4} = \frac{1}{4} = \sin^2 \theta \rightarrow \sin \theta = \pm \frac{\sqrt{2}}{2}$$

$$\sin^2 \theta + \cos^2 \theta = 1 \rightarrow \frac{1}{2} + \cos^2 \theta = 1 \rightarrow \cos^2 \theta = \frac{1}{2}$$

$$0^\circ < \theta < 90^\circ, \sin \theta = \frac{\sqrt{2}}{2}$$

✓

$$\cos \theta = \pm \frac{\sqrt{2}}{2} \rightarrow \tan \theta = \frac{\sin \theta}{\cos \theta} = \frac{\frac{\sqrt{2}}{2}}{\frac{\sqrt{2}}{2}} = 1$$

$$\frac{2 \tan 30^\circ (1 - \tan^2 30^\circ)}{(1 - \cot^2 30^\circ)^2} = \tan \theta \xrightarrow{\tan 30^\circ = \cot 60^\circ} \frac{2 \tan 30^\circ (1 - \tan^2 30^\circ)}{(1 - \tan^2 30^\circ)^2} = \frac{2 \tan 30^\circ}{1 - \tan^2 30^\circ} = \frac{2 \cdot \frac{1}{\sqrt{3}}}{1 - \frac{1}{3}} = \sqrt{3}$$

$$\rightarrow \tan \theta = \sqrt{3} \Rightarrow \theta = 60^\circ = \frac{\pi}{3} \text{ rad}$$

✓

$\tan \theta = 5 \rightarrow \frac{\text{ضلع مقابل}}{\text{ضلع مجاور}} = 5$ $\rightarrow$ $5k$ و k ضلع مجاور



$\sqrt{4k^2 + k^2} = \sqrt{5k^2} = \sqrt{5}k$
وتر = $\frac{1}{2} \sqrt{5}k$ (طول - ضلع)

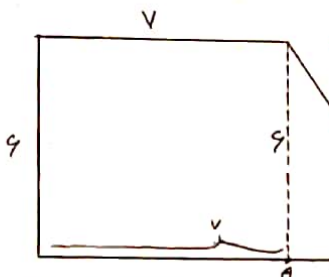
$\rightarrow \sin \theta = \frac{\text{ضلع مقابل}}{\text{وتر}}$ و $\cos \theta = \frac{\text{ضلع مجاور}}{\text{وتر}}$

$\rightarrow \frac{1}{\sqrt{5}k} (5k - k) = \frac{4k}{\sqrt{5}k} = \frac{4}{\sqrt{5}}$

(با $1 + \tan^2 \theta = \frac{1}{\cos^2 \theta}$)

فصل اول
فصل دوم
فصل سوم

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$\rightarrow \sin \alpha = \frac{6}{10} = \frac{3}{5}$ $\rightarrow$ وتر = $\frac{10}{\frac{3}{5}} = \frac{50}{3}$

(2) ✓

$\Rightarrow$ جمل = $4 + 7 + 10 + 1 + 7 = 38$

$|AB| = \sqrt{10^2 - 6^2} = \sqrt{64} = 8$

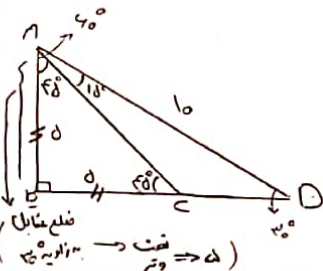
7

$\sin 30^\circ = \frac{AB}{AC} = \frac{1}{2} \Rightarrow AB = \frac{1}{2} AC$

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

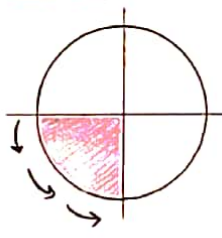
$CD = BD - BC = \frac{AD}{\sqrt{2}} - 5 = 5(\sqrt{2} - 1)$

8



(2) ✓

(الف)

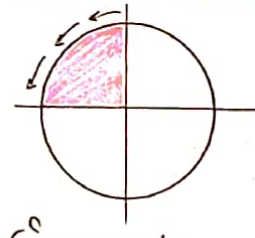


با انترس زاویه:
محسین $\sin$
مجاور $\cos$

محسین $\sin$ زاویه 225°
محسین $\cos$ زاویه 225°

(2) ✓

(ب)



با انترس زاویه:

محسین $\sin$

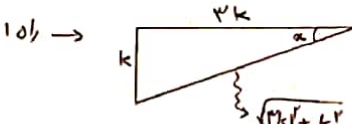
محسین $\cos$

محسین $\sin$

محسین $\cos$

در زاویه دوم با انترس
زاویه $\sin$ و $\cos$ آن
محسین و مجاور

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$\rightarrow \tan \alpha = \frac{3k}{k} = 3$ $\rightarrow$ $\sin \alpha = \frac{3}{\sqrt{10}}$

$\rightarrow \sin \alpha = \frac{k}{\sqrt{10k^2}} = \frac{1}{\sqrt{10}}$

$\sin \alpha = \frac{-\sqrt{10}}{10} \leftarrow \sin \alpha < 0$ است $\rightarrow$ $\sin \alpha = \frac{-\sqrt{10}}{10}$

(2) ✓

$1 + \tan^2 \alpha = \frac{1}{\cos^2 \alpha} \rightarrow 1 + 9 = \frac{1}{\cos^2 \alpha} \rightarrow \cos^2 \alpha = \frac{1}{10} \rightarrow \cos \alpha = \frac{1}{\sqrt{10}}$

$\sin \alpha = \frac{1}{\sqrt{10}} \Rightarrow \sin \alpha = \frac{-\sqrt{10}}{10}$

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