

19,5

1)

المعلومة الثانية:

الف) $27^\circ = x (rad)$

(2)

$$\frac{27}{180} = \frac{x}{\pi} \Rightarrow \frac{27\pi}{180} = x \Rightarrow x = \frac{3\pi}{20} \checkmark$$

ب) $120^\circ = (x) rad$

$$\frac{120}{180} = \frac{x}{\pi} \Rightarrow x = \frac{2\pi}{3} \checkmark$$

ج) $\frac{5\pi}{12} rad = (x)^\circ$

$$\frac{5\pi}{12} = \frac{x}{180} \Rightarrow 12x = 5 \times 180 \Rightarrow x = \frac{5 \times 180}{12} = 75^\circ \checkmark$$

د) $\frac{6\pi}{9} rad = (x)^\circ$

$$\frac{6\pi}{9} = \frac{x}{180} \Rightarrow 9x = 6 \times 180 \Rightarrow x = \frac{6 \times 180}{9} = 120^\circ \checkmark$$

4)

$10a = b$

$$\frac{10a}{a} = \frac{b}{180} \Rightarrow 180x = 10a \Rightarrow x = \frac{10a}{180} = \frac{a}{18} \checkmark$$

(2) (12/5a)°

$$\frac{a}{18} = \frac{y}{180} \Rightarrow y = \frac{a \times 180}{18} = 10a$$

$$\Rightarrow b + x + y = 180 \Rightarrow 10a + \frac{a}{18} + 10a = 180$$

$$\Rightarrow \frac{20a}{18} + \frac{a}{18} = 180 \Rightarrow \frac{21a}{18} = 180 \Rightarrow a = \frac{180 \times 18}{21} = 156 \checkmark$$

٣١

$$\frac{\cos 45^\circ}{\frac{1}{\sqrt{2}}} - \frac{\sin 45^\circ}{\frac{1}{\sqrt{2}}} = \frac{\frac{1}{\sqrt{2}}}{\frac{1}{\sqrt{2}}} - \frac{\frac{1}{\sqrt{2}}}{\frac{1}{\sqrt{2}}} = 1 - 1 = 0$$

$$= \frac{1}{\sqrt{2}} - \frac{1}{\sqrt{2}} = 0 \quad \checkmark$$

(٢)

$$\frac{\tan 45^\circ + \tan 45^\circ}{\cot 45^\circ - \cot 45^\circ} = \frac{1 + 1}{1 - 1} = \frac{2}{0}$$

$$\frac{1 + 1 + 1}{1 - 1} = \frac{3}{0} \quad \checkmark$$

٤١

$$-\frac{\sin 45^\circ}{\frac{1}{\sqrt{2}}} + \frac{\cos 45^\circ}{\frac{1}{\sqrt{2}}} = -\frac{1}{\sqrt{2}} + \frac{1}{\sqrt{2}} = 0$$

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

$$\tan \theta = 1 \quad \checkmark$$

(٢)

٥١

$$\frac{1 + \tan 45^\circ}{1 - \cot 45^\circ} = \frac{1 + 1}{1 - 1} = \frac{2}{0}$$

$$\tan \theta = \frac{1}{\sqrt{2}}$$

$$\cot \theta = \frac{1}{\sqrt{2}}$$

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

(١, ٥)

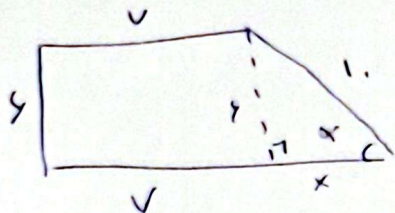
$$\tan \theta = \omega = \frac{\sin \theta}{\cos \theta} \Rightarrow \sin \theta = \omega \cos \theta$$

$$\frac{1}{\sqrt{2}} = \frac{1}{\sqrt{2}} \Rightarrow \theta = 45^\circ \quad \checkmark$$

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

(٢)

۷)



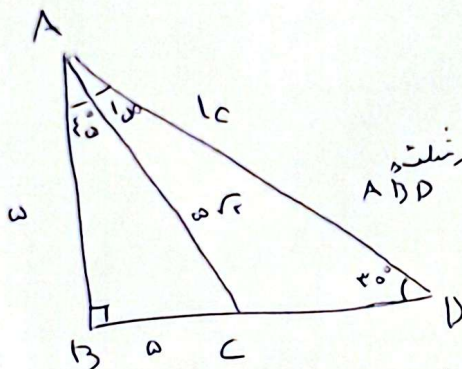
$$\sin \alpha = \frac{\text{ضلع مقابل}}{\text{وتر}} = \frac{6}{10}$$

$$\Rightarrow x^2 + 6^2 = 10^2 \Rightarrow x = 8$$

$$\text{محیط} = 2(6) + 6 + 10 + 8 = 30 \quad \checkmark$$

(۲)

۸)



$$\sin 45^\circ = \frac{\text{ضلع مقابل}}{\text{وتر}} = \frac{AB}{AD} = \frac{AD}{10} = \frac{1}{\sqrt{2}}$$

$$\Rightarrow AB = 5 \quad \checkmark$$

(۲)

$$\sin 45^\circ = \frac{AB}{AC} = \frac{5}{AC} = \frac{1}{\sqrt{2}} \Rightarrow AC = 5\sqrt{2}$$

$$\begin{aligned} \text{در مثل } ABC & \Rightarrow BC^2 + AB^2 = AC^2 \Rightarrow 5^2 + 5^2 = (5\sqrt{2})^2 \Rightarrow 50 + 25 = 50 \Rightarrow BC = 5 \quad \checkmark \\ \text{در مثل } ABD & \Rightarrow 5^2 + (BD+CD)^2 = 10^2 \Rightarrow (BD+CD)^2 = 25 \Rightarrow (BD+CD) = 5 \Rightarrow CD = 5\sqrt{2} - 5 = 5(\sqrt{2}-1) \quad \checkmark \end{aligned}$$

۹)

الف) ناحیه (۱) $\checkmark$
ب) ناحیه (۲) $\checkmark$

(۲)

$$101 \quad \tan x = \frac{\sin x}{\cos x} = \frac{1}{\sqrt{3}} \Rightarrow \sqrt{3} \sin x = \cos x \Rightarrow 9 \sin^2 x = \cos^2 x$$

$$\begin{aligned} \cos^2 x + \sin^2 x = 1 & \Rightarrow 10 \sin^2 x = 1 \Rightarrow \sin^2 x = \frac{1}{10} \Rightarrow \sin x = \pm \frac{1}{\sqrt{10}} \\ & = \frac{-1}{\sqrt{10}} \quad \checkmark \end{aligned}$$