

الف) $2\sqrt{3} \rightarrow \text{rad}$

$$\frac{r \cdot \frac{2\sqrt{3}}{180}}{\frac{r}{180}} = \frac{x}{180} \Rightarrow \frac{2\sqrt{3}}{180} = \frac{x}{180} \Rightarrow x = \frac{2\sqrt{3}}{180} \cdot 180 = 2\sqrt{3}$$

(۲)

ب) $115^\circ \rightarrow \text{rad}$

$$\frac{115}{180} = \frac{x}{180} \Rightarrow x = \frac{115}{180} \cdot 180 = 115$$

ج) $\frac{5\pi}{12} \text{ rad} \rightarrow \text{deg}$

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

د) $\frac{2\pi}{9} \text{ rad} \rightarrow \text{deg}$

$$\frac{\frac{2\pi}{9}}{\frac{\pi}{180}} = \frac{x}{180} \Rightarrow x = \frac{2\pi}{9} \cdot \frac{180}{\pi} = 40^\circ$$

$$\frac{125a}{9} = \frac{D}{180} \Rightarrow \frac{125}{9}a = \frac{D}{180} \Rightarrow D = \frac{125 \times 180}{9} = 2500$$

$$\frac{a}{180} = \frac{D}{180} \Rightarrow D = a$$

$$10a + 125a + 2500a = 180 \Rightarrow 2635a = 180 \Rightarrow a = \frac{180}{2635} = 0.068^\circ$$

الف) $\cos 7^\circ \cos 3^\circ - \sin 7^\circ \sin 3^\circ - \tan 45^\circ + \cot 45^\circ = 2 - 1 = 1$

$$\frac{1}{2} \times \frac{\sqrt{3}}{2} = \frac{\sqrt{3}}{4} \quad \frac{\sqrt{3}}{2} \times \frac{1}{2} = \frac{\sqrt{3}}{4}$$

$$\frac{\tan^2 3^\circ + \tan^2 45^\circ + \tan^2 7^\circ}{\cot^2 3^\circ - \cot^2 7^\circ} = \frac{\frac{1}{4} + 1 + \frac{1}{4}}{\sqrt{3} - \frac{1}{\sqrt{3}}} = \frac{\frac{13}{4}}{\frac{3-1}{\sqrt{3}}} = \frac{13\sqrt{3}}{2}$$

$$-\sin 3^\circ \cos 7^\circ + \cos 3^\circ \sin 7^\circ = \sin \theta \Rightarrow \frac{r}{f} = \sin \theta$$

$$-\frac{1}{f} \times \frac{1}{f} = -\frac{1}{f^2} \quad \frac{\sqrt{3}}{f} \times \frac{\sqrt{3}}{f} = \frac{3}{f^2}$$

$$1 + \cot^2 \theta = \frac{1}{\sin^2 \theta} \Rightarrow 1 + \cot^2 \theta = 2 \Rightarrow \cot^2 \theta = 1 \Rightarrow \tan \theta = 1 \Rightarrow \theta = 45^\circ$$

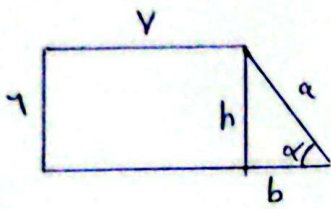
$$\frac{r \tan^2 3^\circ (1 - \tan^2 7^\circ)}{(1 - \cot^2 4^\circ)^2} = \tan \theta \Rightarrow \frac{\frac{r}{\sqrt{3}} (1 - \frac{1}{4})}{(1 - \frac{1}{3})^2} = \frac{r}{\sqrt{3}} = \frac{r}{\sqrt{3}}$$

$$\tan \theta = \frac{r}{\sqrt{3}} \Rightarrow \theta = 4^\circ \checkmark \quad \frac{4}{180} = \frac{x}{180} \Rightarrow x = 4$$

$$\frac{3 \sin \theta - \cos \theta}{\sin \theta - 2 \cos \theta} \Rightarrow \frac{\frac{15}{\sqrt{24}} - \frac{1}{\sqrt{24}}}{\frac{5}{\sqrt{24}} - \frac{2}{\sqrt{24}}} = \frac{14}{1} = 14 \quad \text{یا} \quad \frac{-\frac{15}{\sqrt{24}} - \frac{1}{\sqrt{24}}}{-\frac{5}{\sqrt{24}} - \frac{2}{\sqrt{24}}} = \frac{-14}{-1} = 14 \quad \checkmark \quad (2)$$

$$\tan \theta = 5 \Rightarrow 1 + \tan^2 \theta = \frac{1}{\cos^2 \theta} \Rightarrow 1 + 25 = \frac{1}{\cos^2 \theta} \Rightarrow \cos \theta = \pm \frac{1}{\sqrt{26}} \Rightarrow$$

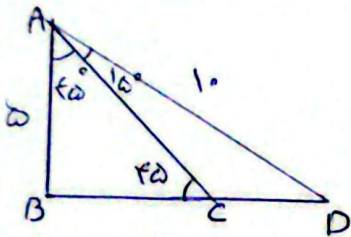
$$\frac{1}{\sqrt{26}} + \sin^2 \theta = 1 \Rightarrow \sin \theta = \pm \frac{5}{\sqrt{26}}$$



$$\sin \alpha = \frac{7}{10} \Rightarrow \frac{h}{a} = \frac{7}{10} \Rightarrow \frac{7}{a} = \frac{7}{10} \Rightarrow a = 10$$

$$a = 10, h = 7 \Rightarrow b = \sqrt{10^2 - 7^2} = 8$$

$$\text{perimeter} = 7 + 10 + 8 + 7 = 32 \quad \checkmark$$

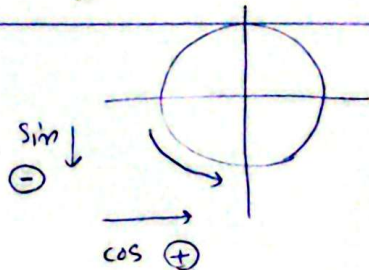


$$45^\circ + 15^\circ = 60^\circ \Rightarrow \sin 60^\circ = \frac{BD}{10} \Rightarrow BD = \frac{10\sqrt{3}}{2} = 5\sqrt{3} \quad (1)$$

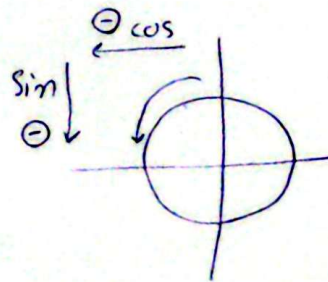
$$AB = \sqrt{10^2 - (5\sqrt{3})^2} = \sqrt{100 - 75} = 5 \Rightarrow BC = 5$$

$$CD = BD - BC = 5\sqrt{3} - 5 \quad \checkmark$$

ربع سوم (الف) $\checkmark$



ربع دوم (ب) $\checkmark$



$$1 + \tan^2 x = \frac{1}{\cos^2 x} \Rightarrow 1 + \frac{9}{9} = \frac{1}{\cos^2 x} \Rightarrow \frac{10}{9} = \frac{1}{\cos^2 x} \Rightarrow \cos^2 x = \frac{9}{10}$$

$$\sin^2 x + \cos^2 x = 1 \Rightarrow \sin^2 x + \frac{9}{10} = 1 \Rightarrow \sin^2 x = \frac{1}{10} \Rightarrow$$

$$\sin x = \pm \frac{1}{\sqrt{10}} \quad \text{X}$$

$$\boxed{-\frac{1}{\sqrt{10}}} \quad \checkmark \quad \checkmark$$

مقدار منفی
sin x