

-1

$$\begin{aligned} \text{الف)} \quad \frac{D}{1\lambda_0} &= \frac{R\alpha d}{\pi} \Rightarrow \frac{rV}{1\lambda_0} = \frac{rad}{\pi} \Rightarrow \boxed{\frac{rV}{\pi}} rad \\ \text{ب)} \quad \frac{rV}{1\lambda_0} &= \frac{rad}{\pi} \Rightarrow \boxed{\frac{rV\pi}{\pi}} rad \end{aligned} \quad \left\{ \begin{aligned} \text{ج)} \quad \frac{D}{1\lambda_0} &= \frac{\frac{\omega r V}{\pi}}{\frac{\pi}{1}} \Rightarrow D = \frac{\omega \times 1\lambda_0}{1} = \boxed{V\omega} \\ \text{د)} \quad \frac{D}{1\lambda_0} &= \frac{\frac{\omega r V}{\pi}}{\frac{\pi}{1}} \Rightarrow D = \frac{\omega \times 1\lambda_0}{9} = \boxed{1.^\circ} \end{aligned} \right.$$

-2

$$\begin{aligned} \left. \begin{aligned} \frac{12\omega\alpha}{9} &= \frac{D}{1\lambda_0} \Rightarrow \frac{12\omega\alpha}{1\lambda_0} = \frac{D}{1\lambda_0} \Rightarrow D = \frac{12\omega\alpha \times 1\lambda_0}{1.1\lambda_0} = 12\omega\alpha \\ \frac{\frac{\omega r V}{\pi}}{\frac{\pi}{1}} &= \frac{D}{1\lambda_0} \Rightarrow D = \frac{\omega \times 1\lambda_0}{rV} = 12\omega\alpha \end{aligned} \right\} \Rightarrow 12\omega\alpha + 12\omega\alpha + 10\alpha = 1\lambda_0 \Rightarrow \alpha(12\omega + 12\omega + 10) = 1\lambda_0 \\ \Rightarrow \alpha = \frac{1\lambda_0}{\epsilon\omega} = \boxed{1.^\circ} \end{aligned}$$

-3

$$\begin{aligned} \text{الف)} \quad \underbrace{\cos^2\epsilon^\circ - \sin^2\epsilon^\circ}_{\sin^2\epsilon^\circ = \cos^2\epsilon^\circ, \sin^2\epsilon^\circ = \cos^2\epsilon^\circ} - \underbrace{\tan^2\epsilon^\circ + \cot^2\epsilon^\circ}_{\cot^2\epsilon^\circ = \tan^2\epsilon^\circ} &= 0 + \cot^2\epsilon^\circ = \boxed{1} \\ \text{ب)} \quad \frac{\tan^2\epsilon^\circ + \tan^2\epsilon^\circ + \tan^2\epsilon^\circ}{\cot^2\epsilon^\circ - \cot^2\epsilon^\circ} &= \frac{(\frac{1}{\sqrt{3}})^2 + 1 + (\sqrt{3})^2}{(\sqrt{3})^2 - (\frac{1}{\sqrt{3}})^2} = \frac{\frac{1}{3} + 1 + 3}{3 - \frac{1}{3}} = \frac{\frac{14}{3}}{\frac{8}{3}} = \boxed{\frac{14}{8}} \end{aligned}$$

$$\begin{aligned} -\sin^2\epsilon^\circ + \cos^2\epsilon^\circ + \cos^2\epsilon^\circ - \sin^2\epsilon^\circ &= \sin^2\theta \Rightarrow -\sin^2\epsilon^\circ + \cos^2\epsilon^\circ = -(\frac{1}{3})^2 + (\frac{\sqrt{3}}{3})^2 = \frac{2}{3} \Rightarrow \sin^2\theta = \frac{2}{3} \Rightarrow \sin\theta = \pm \frac{\sqrt{2}}{\sqrt{3}} \Rightarrow \theta = \epsilon^\circ \Rightarrow \tan\epsilon^\circ = \frac{\sin\epsilon^\circ}{\cos\epsilon^\circ} = \frac{\frac{\sqrt{2}}{\sqrt{3}}}{\frac{1}{\sqrt{3}}} = \boxed{1} \end{aligned}$$

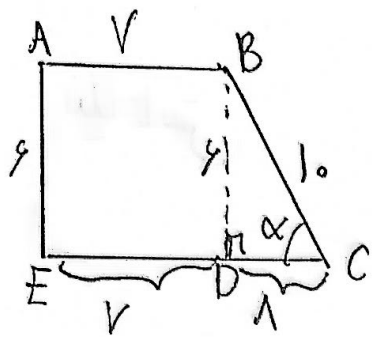
چون زاویه حاد است
قابل قبول است

-4

$$\frac{r \tan^2\epsilon^\circ (1 - \tan^2\epsilon^\circ)}{(1 - \cot^2\epsilon^\circ)^2} = \tan\theta \Rightarrow \frac{r \left(\frac{1}{\sqrt{3}}\right)^2 \left(1 - \left(\frac{1}{\sqrt{3}}\right)^2\right)}{\left(1 - \left(\frac{1}{\sqrt{3}}\right)^2\right)^2} = \tan\theta \Rightarrow \theta = \epsilon^\circ \Rightarrow \boxed{\frac{\pi}{3} rad} = \theta$$

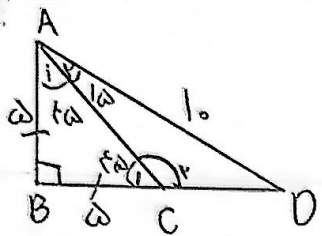
-5

$$\tan\theta = \omega \Rightarrow \frac{\sin\theta}{\cos\theta} = \omega \Rightarrow \sin\theta = \omega \cos\theta \Rightarrow \frac{r \sin\theta - \cos\theta}{\sin\theta - \epsilon \cos\theta} = \frac{1\omega \cos\theta - \cos\theta}{1 \cos\theta} = \boxed{1}$$



$$\frac{BD}{BC} = \frac{4}{10} \Rightarrow BC = 10 \Rightarrow DC = \sqrt{10^2 - 6^2} = \sqrt{64} = 8 \Rightarrow P = 6 + 7 + 10 + 8 + 7 = \boxed{38}$$

-V



$$\begin{aligned} \hat{A} = 60^\circ &\Rightarrow \frac{BD}{AD} = \frac{\sqrt{3}}{2} \Rightarrow BD = \omega\sqrt{3} \\ &\Rightarrow \frac{AB}{AD} = \frac{1}{2} \Rightarrow AB = \omega \\ \hat{A}_1 = \hat{C}_1 = 45^\circ &\Rightarrow AB = BC = \omega \end{aligned} \Rightarrow DC = \boxed{\omega\sqrt{3} - \omega}$$

-A

الف) θ زیاد $\rightarrow$ $\sin \theta$ کم $\rightarrow$ $\cos \theta$ زیاد $\Rightarrow$ $\boxed{\text{ناقص}}$ } ب) θ زیاد $\rightarrow$ $\sin \theta$ کم, $\cos \theta$ کم $\Rightarrow$ $\boxed{\text{ناقص}}$

ناقص ۲ و ۳ ناقص ۲ و ۳ ناقص ۲ و ۳

-9

$$\tan x = \frac{\sin x}{\cos x} = \frac{1}{3} \Rightarrow \cos x = 3 \sin x, \sin x < 0, \cos x < 0$$

-10

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

چون در ناحیه ۳ است $\sin x$ منفی است