

$$\begin{aligned}\sin 120^\circ &\Rightarrow \sin(\frac{\pi}{4} + \frac{\pi}{6}) \rightarrow +\cos \frac{\pi}{6} \\ \sin 120^\circ &\Rightarrow \sin(\frac{\pi}{4} + \frac{\pi}{6}) \rightarrow -\cos \frac{\pi}{6} \\ \cos 120^\circ &\Rightarrow \cos(\frac{\pi}{4} + \frac{\pi}{6}) \rightarrow +\sin \frac{\pi}{6} \\ \cos 120^\circ &\Rightarrow \cos(\pi - \frac{\pi}{6}) \rightarrow -\cos \frac{\pi}{6}\end{aligned}$$

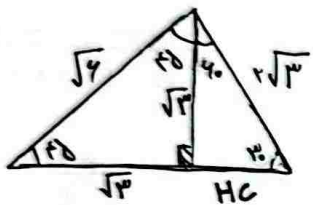
$$\begin{aligned}(\cos 120^\circ - \cos 120^\circ)(\sin 120^\circ - (-\cos 120^\circ)) \\ (\frac{\sqrt{2}}{2} - \frac{\sqrt{3}}{2})(\frac{\sqrt{2}}{2} + \frac{\sqrt{3}}{2}) \Rightarrow \frac{2}{4} - \frac{3}{4} \Rightarrow \left(-\frac{1}{4}\right)\end{aligned}$$

①
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ب

$$\tan(120^\circ) \rightarrow \tan(\pi - 120^\circ) = \frac{\tan \pi - \tan 120^\circ}{1 - \tan \pi \tan 120^\circ} = \frac{1}{\sqrt{3}}$$

$$\begin{aligned}\cos(120^\circ) &\rightarrow \cos(\pi - 120^\circ) \Rightarrow +\cos 120^\circ \rightarrow \frac{\sqrt{3}}{2} \\ \cos(120^\circ) &\rightarrow \cos(\pi + 120^\circ) \Rightarrow -\cos 120^\circ \rightarrow -\frac{\sqrt{3}}{2}\end{aligned}$$

$$\frac{1 + 3\left(\frac{1}{\sqrt{3}}\right)^2}{3\left(\frac{\sqrt{3}}{2}\right)^2 + 3\left(-\frac{\sqrt{3}}{2}\right)^2} \Rightarrow \frac{2}{3 + 1} \Rightarrow \left(\frac{1}{2}\right)$$

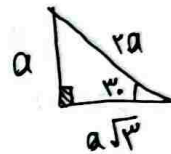


$$a\sqrt{3} = 4 \rightarrow a = \frac{4}{\sqrt{3}}$$

$$HC = a\sqrt{3} \Rightarrow \sqrt{3} \times \frac{4}{\sqrt{3}} = 4$$

$$HC = 4$$

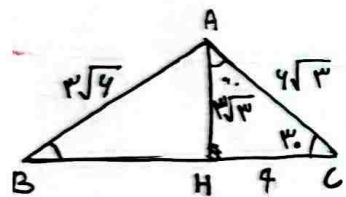
سؤال ٢



$$a\sqrt{3} = 4 \rightarrow a = \frac{4}{\sqrt{3}} \rightarrow \frac{4\sqrt{3}}{3}$$

$$AH = a \Rightarrow \frac{4\sqrt{3}}{3}$$

$$\sin B = \frac{4\sqrt{3}}{3 \times \frac{4\sqrt{3}}{3}} = \frac{1}{\sqrt{2}} = \frac{\sqrt{2}}{2} \Rightarrow B = 45^\circ$$

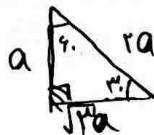


$$a\sqrt{3} = 8 \cdot \sqrt{3} \Rightarrow a = 8 = BD$$

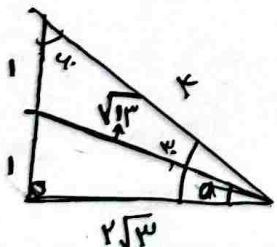
$$BC = 8 + 8$$

$$AC = 8 \times 8 \cdot \sqrt{3} = 64\sqrt{3} \Rightarrow \frac{1}{\sqrt{3}} = \frac{8\sqrt{3}}{64\sqrt{3}} \Rightarrow \frac{1}{8}$$

$$BC = a\sqrt{3} \Rightarrow 128 = 8 + 8 \Rightarrow 8 = 16$$



سؤال ٣



$$\sin \alpha = \frac{1}{\sqrt{13}} = \frac{\sqrt{13}}{13}$$

$$\frac{BC}{\sin A} = \frac{AC}{\sin B} = \frac{AB}{\sin C}$$

سؤال ٤

$$\frac{AB}{AC} = \frac{\sin C}{\sin B} = \frac{\sin(45^\circ + 45^\circ)}{\sin 30^\circ} = \frac{\frac{\sqrt{2} + \sqrt{2}}{2}}{\frac{1}{2}} = \frac{\sqrt{2} + \sqrt{2}}{1}$$

$$\sin(45^\circ + 45^\circ) \rightarrow \sin 45^\circ \cos 45^\circ + \cos 45^\circ \sin 45^\circ \Rightarrow \frac{\sqrt{2}}{2} \times \frac{\sqrt{2}}{2} + \frac{\sqrt{2}}{2} \times \frac{\sqrt{2}}{2} \rightarrow \frac{\sqrt{2} + \sqrt{2}}{2}$$

(سؤال ٥)

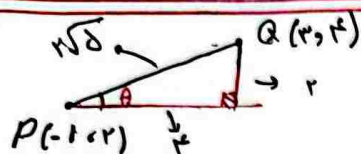
$$\frac{SABE}{SBCD} \Rightarrow \frac{\frac{1}{r} \sin B \times r \times r}{\frac{1}{r} \sin B \times r \times y} = \frac{1}{1/\lambda} = \frac{r}{q}$$

(سؤال ٩)

ا) $r(\frac{1}{r} \sin 120^\circ \times r \times r) = r(\frac{1}{r} \times \frac{\sqrt{3}}{2} \times r \times r) \rightarrow 4\sqrt{3}$

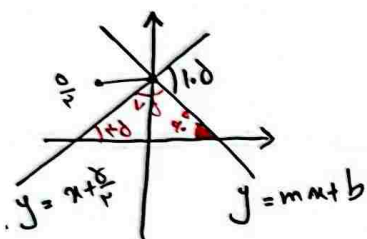
ب) $\frac{1}{r} \sin 120^\circ \times r \times r \Rightarrow \frac{1}{r} \times \frac{\sqrt{3}}{2} \times r \times r \rightarrow 3\sqrt{3}$

(سؤال ٧)



$$\cos \theta = \frac{r}{r\sqrt{8}} \Rightarrow \frac{r}{\sqrt{8}} \times \frac{\sqrt{8}}{\sqrt{8}} \Rightarrow \frac{r\sqrt{8}}{8}$$

(سؤال ٨)



$$\tan \theta = 1$$

$$m = \tan \theta \Rightarrow \underline{m = 1}$$

$$m \times b = \frac{b\sqrt{3}}{r}$$

$$\boxed{b = \frac{b}{r}}$$

$$\cos(\pi + \alpha) \rightarrow -\cos \alpha \quad f(m) = -\cos m + \cos m - (-\cot m) \Rightarrow \underline{\cot m}$$

$$\sin\left(\frac{\pi}{2} - \alpha\right) \rightarrow +\cos \alpha$$

$$f(\alpha) = \cot \alpha \xrightarrow{f\left(\frac{3\pi}{4}\right)} \cot(135^\circ) \Rightarrow -\sqrt{3}$$

$$\tan\left(\frac{3\pi}{4} + \alpha\right) \rightarrow -\cot \alpha$$

$$\frac{D}{4} = \frac{D}{1/\lambda} \rightarrow \underline{D = 10^\circ}$$

(سؤال ١٠)

$$\frac{\sin\left(\frac{\pi}{2} + \alpha\right) + \cos\left(\frac{3\pi}{4} - \alpha\right)}{\cos(\pi + \alpha) - \sin(-\alpha)} = \frac{\cos(\alpha) - \sin(\alpha)}{-\cos(\alpha) + \sin(\alpha)} = -1$$