

۲۰ افزین!

الف) $(\sin 135^\circ + \sin 30^\circ)(\cos 315^\circ - \cos 15^\circ)$ (۲) ①

$$= \left(\frac{\sqrt{2}}{2} + \left(-\frac{\sqrt{3}}{2} \right) \right) \left(\frac{\sqrt{2}}{2} - \left(-\frac{\sqrt{3}}{2} \right) \right) = \frac{\sqrt{2} - \sqrt{3}}{2} \times \frac{\sqrt{2} + \sqrt{3}}{2}$$

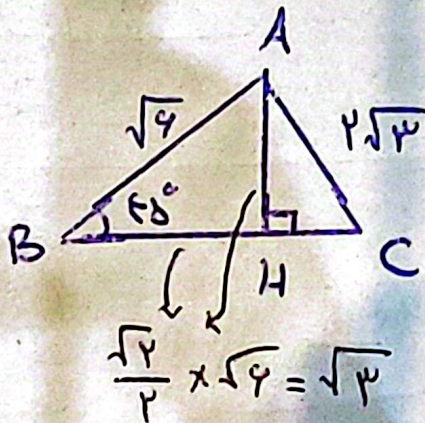
$$= \frac{2 - 3}{4} = \boxed{-\frac{1}{4}} \quad \checkmark$$

ب) $\frac{1 + 3 \tan^2 210^\circ}{4 \cos^2 330^\circ + 2 \cos^2 240^\circ} = \frac{1 + 3 \times \left(-\frac{\sqrt{3}}{3} \right)^2}{4 \times \left(\frac{\sqrt{3}}{2} \right)^2 + 2 \times \left(-\frac{\sqrt{2}}{2} \right)^2}$

$$= \frac{1 + 1}{3 + 1} = \frac{2}{4} = \boxed{\frac{1}{2}} \quad \checkmark$$

الف)

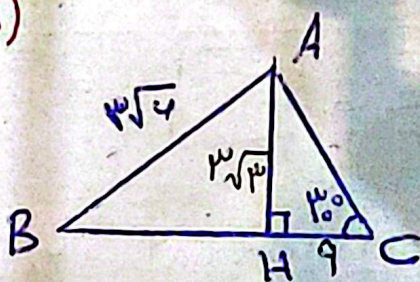
$$HC^2 = AC^2 - AH^2 = 12 - 3 = 9$$



$$\downarrow$$

$$HC = \sqrt{9} = \boxed{3} \quad \checkmark$$

ب)



$$\frac{9}{AH} = \cot 30^\circ = \sqrt{3} \rightarrow AH = 3\sqrt{3}$$

$$\sin \hat{B} = \frac{AH}{AB} = \frac{3\sqrt{3}}{3\sqrt{4}} = \frac{\sqrt{2}}{2} \rightarrow \hat{B} = \boxed{45^\circ} \quad \checkmark$$

(الف)

$$BD = \frac{1}{\sqrt{3}} \times \omega_0 \sqrt{3} = \omega_0$$

$$BC = \frac{\omega_0 \sqrt{3}}{\frac{\sqrt{3}}{3}} = 1\omega_0$$

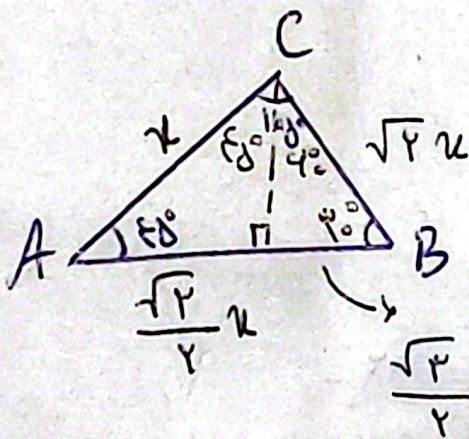
$$K = BC - BD = 1\omega_0 - \omega_0 = \omega_0$$

(ب)

$$BC = \frac{2}{\frac{\sqrt{3}}{3}} = \frac{4}{\sqrt{3}} = 2\sqrt{3}$$

$$DC^2 = 1^2 + (2\sqrt{3})^2 = 13 \rightarrow DC = \sqrt{13}$$

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



$$\frac{AB}{AC} = \frac{\frac{\sqrt{2}}{2}x + \frac{\sqrt{6}}{2}x}{x}$$

$$= \frac{\sqrt{2} + \sqrt{6}}{2} = \frac{1 + \sqrt{3}}{\sqrt{2}}$$

$$\frac{S_{\triangle ABE}}{S_{\triangle BCD}} = \frac{\frac{1}{2} \times 4 \times 8 \times \sin 120^\circ}{\frac{1}{2} \times 3 \times 4 \times \sin 120^\circ} = \frac{8}{9}$$

(الف)

$$S_{\square} = 4 \times \frac{1}{4} \times 3 \times 8 \times \sin 120^\circ = 4 \times \frac{\sqrt{3}}{4} = 4\sqrt{3}$$

(ب) درستی افلاخ مطروحات

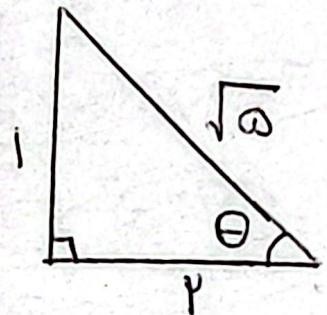
$$S_{\square} = 8 \times \frac{1}{4} \times 4 \times 10 \times \sin 45^\circ = 4 \times \frac{\sqrt{2}}{2} = 2\sqrt{2}$$

$$r = \tan \theta \times (-1) + b$$

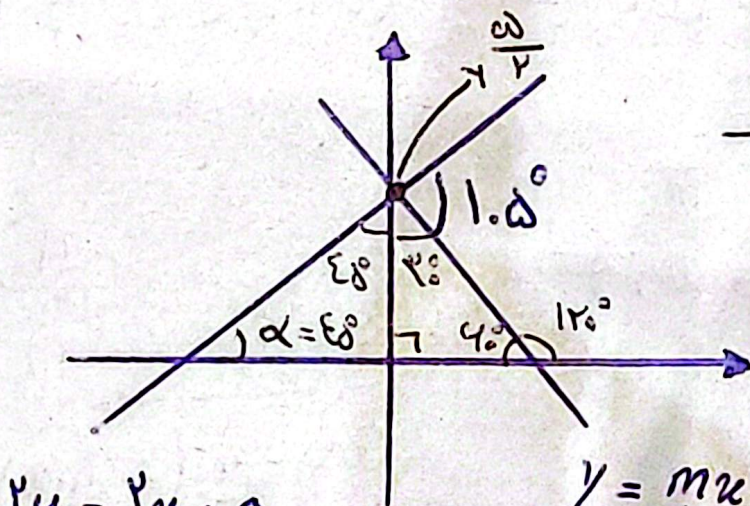
$$r = \tan \theta \times r + b$$

$$r = r \tan \theta \rightarrow \tan \theta = \frac{1}{r} \rightarrow$$

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



(r) (v)



$$ry = rx + w$$

$$\rightarrow y = x + \frac{w}{r}$$

$$\rightarrow b = \frac{w}{r}$$

$$\tan \alpha = 1 \rightarrow \alpha = 45^\circ$$

$$ry = rx + w$$

$$y = mx + b$$

$$\tan 135^\circ = -\sqrt{r}$$

$$mb = -\sqrt{r} \times \frac{w}{r} = \frac{-w\sqrt{r}}{r}$$

(v)

(r)

$$f' \left(\frac{\omega\pi}{4} \right) = \cos \left(\pi + \frac{\omega\pi}{4} \right) + \sin \left(\frac{\pi}{4} - \frac{\omega\pi}{4} \right) - \tan \left(\frac{5\pi}{4} + \frac{\omega\pi}{4} \right) \quad (9)$$

~~$$= \cos \frac{\omega\pi}{4} - \sin \frac{\omega\pi}{4} - \tan \frac{\omega\pi}{4} = \cot \frac{\omega\pi}{4}$$~~

~~$$= \cos \pi \cos \frac{\omega\pi}{4} - \sin \pi \sin \frac{\omega\pi}{4} + \sin \frac{\pi}{4} \cos \frac{\omega\pi}{4} - \cos \frac{\pi}{4} \sin \frac{\omega\pi}{4} - \left(\tan \frac{5\pi}{4} + \tan \frac{\omega\pi}{4} \right)$$~~

~~$$= \cos \pi \cos \frac{\omega\pi}{4} - \sin \pi \sin \frac{\omega\pi}{4} + \sin \frac{\pi}{4} \cos \frac{\omega\pi}{4} - \cos \frac{\pi}{4} \sin \frac{\omega\pi}{4} - \left(\tan \frac{5\pi}{4} + \tan \frac{\omega\pi}{4} \right)$$~~

$$= -\cos \frac{\omega\pi}{4} + \cos \frac{\omega\pi}{4} + \cot \frac{\omega\pi}{4} = \cot \frac{\omega\pi}{4} = \boxed{-\sqrt{w}} \quad \checkmark$$

$$= \frac{\sin \left(\frac{\pi}{4} + u \right) + \cos \left(\frac{5\pi}{4} - u \right)}{\cos (\pi + u) - \sin (-u)} = \frac{\cos u + (-\sin u)}{-\cos u - (-\sin u)} \quad (10)$$

$$= \frac{\cos u - \sin u}{\sin u - \cos u} = \boxed{-1} \quad \checkmark$$