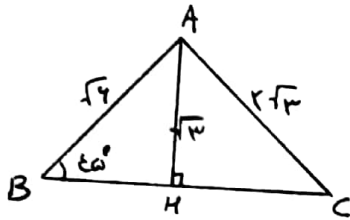


$$(الف) (\sin 135^\circ + \sin 45^\circ)(\cos 135^\circ - \cos 45^\circ) = \left(\frac{\sqrt{2}}{2} - \frac{\sqrt{2}}{2}\right) \left(\frac{\sqrt{2}}{2} + \frac{\sqrt{2}}{2}\right) = \frac{2}{2} - \frac{2}{2} = -\frac{1}{2}$$

$$ب) \frac{1 + 2 \tan^2 45^\circ}{2 \cos^2 45^\circ + 2 \cos^2 45^\circ} = \frac{1 + 2 \times \left(\frac{1}{\sqrt{2}}\right)^2}{2 \times \left(\frac{\sqrt{2}}{2}\right)^2 + 2 \times \left(-\frac{\sqrt{2}}{2}\right)^2} = \frac{1 + 1}{2 + 2} = \frac{2}{4} = \frac{1}{2}$$

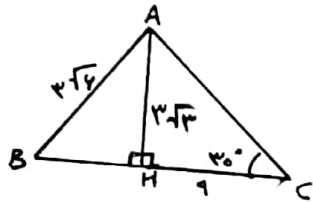


$$\sin 45^\circ: \frac{\sqrt{2}}{2} = \frac{AH}{\sqrt{4}} \Rightarrow AH = \frac{\sqrt{2} \times \sqrt{4}}{2} = \frac{\sqrt{2} \times 2}{2} = \sqrt{2}$$

$$AH = \sqrt{2}$$

$$HC^2 = (2\sqrt{3})^2 - (\sqrt{2})^2 \Rightarrow HC^2 = 12 - 2 = 10 \Rightarrow HC = \sqrt{10}$$

$$HC = \sqrt{10} \Rightarrow \text{طول ضلعی قائم و اند مقعر ٢٥}$$



$$\tan 45^\circ: \frac{AH}{1} = \frac{\sqrt{3}}{3} \Rightarrow AH = \frac{3\sqrt{3}}{3} = \sqrt{3}$$

$$\sin 45^\circ: \frac{3\sqrt{3}}{3\sqrt{3}} = \frac{\sqrt{3}}{3} \Rightarrow \frac{3\sqrt{3}}{3\sqrt{3}} = \frac{\sqrt{3}}{3} \Rightarrow \frac{1}{1} = \frac{1}{1} \Rightarrow \frac{1}{1} = 1$$

$$\frac{1}{1} = 1$$

$$\tan 45^\circ: \frac{\sqrt{3}}{BD} = \frac{\omega \cdot \sqrt{3}}{BD} \Rightarrow BD = \frac{\omega \cdot \sqrt{3}}{\sqrt{3}} = \omega$$

$$r = \omega \quad (الف) ٣$$

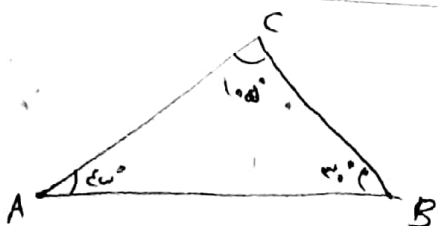
$$\tan 45^\circ: \frac{\sqrt{3}}{BC} = \frac{\omega \cdot \sqrt{3}}{BC} \Rightarrow BC = \frac{\omega \cdot \sqrt{3}}{\sqrt{3}} = \omega$$

$$\omega = \pi + \omega \Rightarrow \pi = 100$$

$$\tan 45^\circ = \frac{BC}{r} = \sqrt{3} \Rightarrow BC = r\sqrt{3}$$

$$DC^2 = 1^2 + (r\sqrt{3})^2 \Rightarrow DC^2 = 1 + r^2 \Rightarrow DC = \sqrt{1+r^2}$$

$$r = \sin \alpha \quad (ب) \Rightarrow \sin \alpha = \frac{BD}{DC} = \frac{1}{\sqrt{1+r^2}} = \frac{\sqrt{1+r^2}}{1+r^2}$$



$$\frac{BC}{\frac{\sqrt{3}}{2}} = \frac{AC}{\frac{1}{2}} = \frac{AB}{\frac{\sqrt{4}+\sqrt{2}}{2}} \Rightarrow \frac{AB}{AC} = \frac{\sqrt{4}+\sqrt{2}}{2} \cdot \frac{1}{\frac{1}{2}} = \frac{AB}{AC} = ?$$

$$\sin 100^\circ = \sin (40^\circ + 60^\circ)$$

$$\sin 40^\circ \cos 60^\circ + \cos 40^\circ \sin 60^\circ = \frac{\sqrt{3}}{2} \times \frac{1}{2} + \frac{1}{2} \times \frac{\sqrt{3}}{2} = \frac{\sqrt{3}}{4} + \frac{\sqrt{3}}{4} = \frac{\sqrt{3}}{2}$$

$$\frac{s_{ABE}}{s_{BCD}} = ? \quad \frac{r \times r \times \frac{1}{r} \times \sin \hat{B}}{r \times r \times \frac{1}{r} \times \sin \hat{B}} = \boxed{\frac{r}{r}} \quad (a)$$

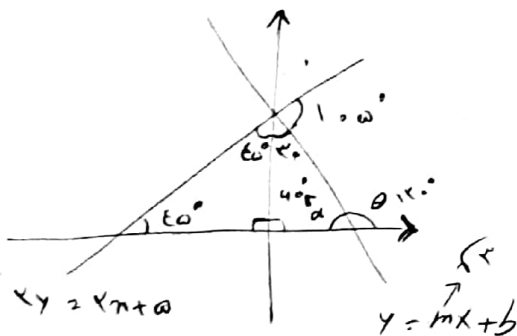
$$a) r \times r \times \sin 120^\circ \times \frac{1}{r} \times r = r \times r \times \frac{\sqrt{3}}{2} = \boxed{4\sqrt{3}} \quad (4)$$

$$b) \frac{1}{r} \times r \times r \times \sin 120^\circ = \frac{r}{r} \times \frac{\sqrt{3}}{2} = \boxed{4\sqrt{3}}$$

$$y = ax + b \quad \boxed{b} = \frac{r - r}{r - (-1)} = \frac{r}{r} = \boxed{\frac{1}{r}} \Rightarrow \frac{b}{r} = \tan \theta \quad (v)$$

$$1 + \tan^2 \theta = \frac{1}{\cos^2 \theta} \Rightarrow 1 + \left(\frac{1}{r}\right)^2 = \frac{1}{\cos^2 \theta} \Rightarrow \frac{1 + \frac{1}{r^2}}{\frac{1}{r^2}} = \frac{1}{\cos^2 \theta} \Rightarrow \cos^2 \theta = \frac{r^2}{1 + r^2}$$

$$\boxed{\cos \theta} = \frac{r}{\sqrt{1 + r^2}} = \boxed{\frac{r\sqrt{a}}{\omega}}$$



$$mb = ? \quad (A)$$

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

$$m = \tan \theta = \tan 40^\circ = \sqrt{r}$$

$$\theta = 120^\circ - (10 + 10) = 40^\circ$$

$$y = 2x + 10$$

$$y = x + \frac{a}{r}$$

$$m = 1$$

$$\rightarrow a = 10^\circ$$

$$x = 0 \rightarrow y = \frac{a}{r}$$

$$\rightarrow y = mx + b \rightarrow \frac{a}{r} = \sqrt{r} \times \frac{a}{r} + b \rightarrow \boxed{b = \frac{a}{r}}$$

$$f(x) = \cos(\pi + x) + \sin\left(\frac{\pi}{r} - x\right) - \tan\left(\frac{\pi}{r} + x\right) \Rightarrow -\cos x + \cos x + \cot x \quad (9)$$

$$f(x) = \cot x \rightarrow f\left(\frac{a\pi}{4}\right) = \cot\left(\frac{a\pi}{4}\right) \Rightarrow \boxed{-\sqrt{r}}$$

$$\frac{\sin\left(\frac{16\pi}{r} + x\right) + \cos\left(\frac{16\pi}{r} - x\right)}{\cos(4\pi + x) - \sin(4\pi - x)} = \frac{-\cos x + \sin x}{\cos x - \sin x} = \frac{-(\cos x - \sin x)}{\cos x - \sin x} = \boxed{-1} \quad (10)$$