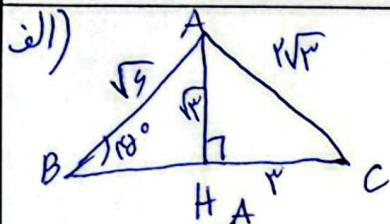
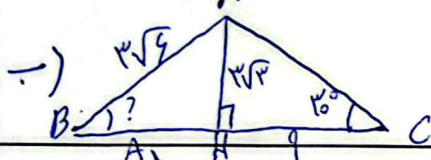


$$\begin{aligned} \text{الف)} \quad & (\sin 135^\circ + \sin 225^\circ)(\cos 135^\circ - \cos 225^\circ) = \left(\frac{\sqrt{2}}{2} + \left(-\frac{\sqrt{2}}{2}\right)\right) \left(\frac{\sqrt{2}}{2} - \left(-\frac{\sqrt{2}}{2}\right)\right) \\ & = \left(\frac{\sqrt{2} - \sqrt{2}}{2}\right) \left(\frac{\sqrt{2} + \sqrt{2}}{2}\right) = \frac{2-2}{4} = \frac{-1}{4} \end{aligned}$$

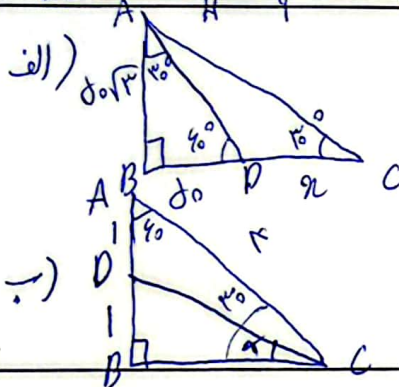
$$\text{ب-)} \quad \frac{1 + 3 \tan^2 45^\circ}{3 \cos^2 45^\circ + 2 \cos^2 135^\circ} = \frac{1 + 3 \times \frac{1}{1}}{3 \times \frac{1}{2} + 2 \times \frac{1}{2}} = \frac{4}{3} = \frac{4}{3}$$



$$\begin{aligned} AH &= \frac{\sqrt{2}}{2} \times \sqrt{2} = \frac{\sqrt{2}}{2} \times \frac{2\sqrt{2}}{2} = \sqrt{2} \\ HC &= \sqrt{AC^2 - AH^2} = \sqrt{12 - 2} = \sqrt{10} = 3 \end{aligned}$$



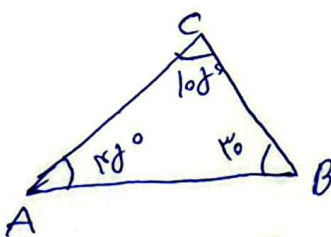
$$\begin{aligned} \tan 45^\circ &= \frac{AH}{HC} = \frac{3\sqrt{2}}{3} \\ \sin B &= \frac{AH}{AB} = \frac{3\sqrt{2}}{6\sqrt{2}} = \frac{1}{2} \Rightarrow B = 30^\circ \end{aligned}$$



$$\begin{aligned} BD &= \frac{1}{\sqrt{3}} \times AD = 100 \\ \frac{\sqrt{3}}{2} \times AD &= 100\sqrt{3} \Rightarrow AD = 200 \\ \frac{1}{2} \times AC &= 100\sqrt{3} \Rightarrow AC = 200\sqrt{3} \\ BC &= \frac{\sqrt{3}}{2} \times 200\sqrt{3} = 300 \end{aligned}$$



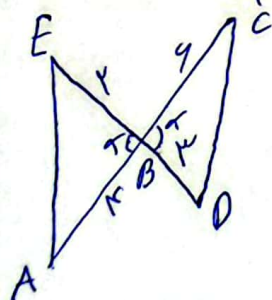
$$\begin{aligned} \frac{1}{2} AC &= 100 \Rightarrow AC = 200 \\ BC &= \frac{\sqrt{3}}{2} \times 200 = 100\sqrt{3} \\ \Rightarrow DC &= \sqrt{100^2 + 100^2} = 100\sqrt{2} \end{aligned}$$



$$\frac{AB}{\sin 105^\circ} = \frac{AC}{\sin 30^\circ} \Rightarrow \frac{AB}{AC} = \frac{\sin 105^\circ}{\sin 30^\circ}$$

$$\begin{aligned} \sin 105^\circ &= \sin(45^\circ + 60^\circ) = \sin 45^\circ \cos 60^\circ + \sin 60^\circ \cos 45^\circ \\ &= \frac{\sqrt{2}}{2} \times \frac{1}{2} + \frac{\sqrt{3}}{2} \times \frac{\sqrt{2}}{2} = \frac{\sqrt{2}}{4} + \frac{\sqrt{6}}{4} = \frac{\sqrt{2} + \sqrt{6}}{4} \end{aligned}$$

$$\frac{AB}{AC} = \frac{\frac{\sqrt{2} + \sqrt{6}}{4}}{\frac{1}{2}} = \frac{\sqrt{2} + \sqrt{6}}{2}$$



$$\frac{S_{ABE}}{S_{BCD}} = \frac{\frac{1}{2} \times 4 \times 2 \times \sin \theta}{\frac{1}{2} \times 9 \times 6 \times \sin \theta} = \frac{4}{9}$$

$$\text{الف) } S = r \times r \times \sin 140^\circ = 12 \times \frac{\sqrt{3}}{2} = 6\sqrt{3}$$

6

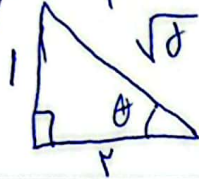
$$\text{ب) } S = \frac{1}{r} \times r \times r \times \sin 140^\circ = 4 \times \frac{\sqrt{3}}{2} = 2\sqrt{3}$$

$$y = \frac{1}{r}x + \frac{d}{r}$$

$$y = ax + b$$

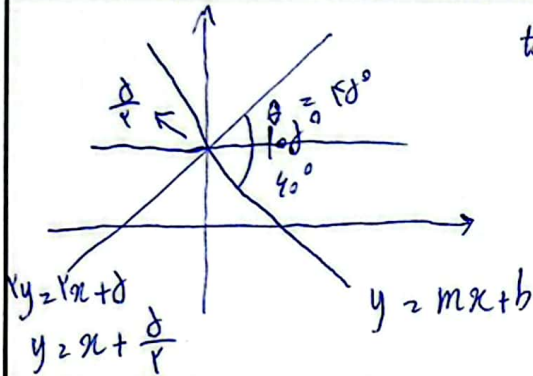
$$a = \frac{r-r}{r+1} = \frac{1}{r} \quad \frac{1}{r}x + b = r \Rightarrow b = \frac{d}{r}$$

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



$$\cos \theta = \frac{r}{\sqrt{d}} = \frac{r\sqrt{d}}{d}$$

7



$$\tan \theta = 1 \quad \theta = 45^\circ$$

$$m = \tan 140^\circ = -\sqrt{3}$$

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

$$mb = \frac{-d\sqrt{3}}{r}$$

8

$$f\left(\frac{\partial x}{y}\right) = \cos\left(\pi + \frac{\partial x}{y}\right) + \sin\left(\frac{\pi}{y} - \frac{\partial x}{y}\right) - \tan\left(\frac{rx}{y} + \frac{\partial x}{y}\right)$$

$$\left(\cos \frac{\partial x}{y}\right) + \left(-\cos \frac{\partial x}{y}\right) - \left(\cot \frac{\partial x}{y}\right) = \sqrt{3}$$

$$\downarrow$$

$$-\sqrt{3}$$

9

$$\frac{\sin\left(\frac{14x}{y} + \pi\right) + \cos\left(\frac{1d\pi}{y} - \pi\right)}{\cos\left(\frac{rx}{y} + \pi\right) - \sin\left(\frac{4x}{y} - \pi\right)} = \frac{(\cos \pi) + (-\sin \pi)}{(-\cos \pi) - (-\sin \pi)} =$$

$$\frac{\cos \pi - \sin \pi}{\sin \pi - \cos \pi} = -1$$

10