

$$\left(\frac{\sqrt{2}}{2} - \frac{\sqrt{3}}{2} \right) \left(\frac{\sqrt{3}}{2} + \frac{\sqrt{2}}{2} \right) = \frac{\sqrt{6} - 3}{2} = \frac{\sqrt{6} - 3}{2}$$

(الف)

۱

$$\frac{1 + 3 \times \frac{1}{3}}{\left(\frac{3}{4} \times 4 \right) + \left(\frac{1}{4} \times 2 \right)} = \frac{1}{2}$$

(ب)

(الف) ضلع روبه روی زاویه 45° وتر $\frac{\sqrt{2}}{2}$ $AH = \frac{2\sqrt{3}}{2} = \sqrt{3}$

$$CH^2 + (\sqrt{3})^2 = (2\sqrt{3})^2 \rightarrow CH^2 = 9 \rightarrow CH = 3$$

۲

(ب) ضلع روبه روی زاویه 30° وتر است $\frac{\sqrt{3}}{2}$ $AC = 2\sqrt{3}$ $\frac{\sqrt{3}}{2} = \frac{9}{AC}$

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

$$BD = \text{ضلع وتر} = 50$$

$$\frac{\sqrt{3}}{2} = \frac{50\sqrt{3}}{AD} \rightarrow AD = 100$$

$$BC = \frac{50}{\frac{\sqrt{3}}{2}} = \frac{BC}{100\sqrt{3}} \rightarrow BC = 150 \quad BC = 50 + x = 150 \rightarrow x = 100$$

(ب)

۳

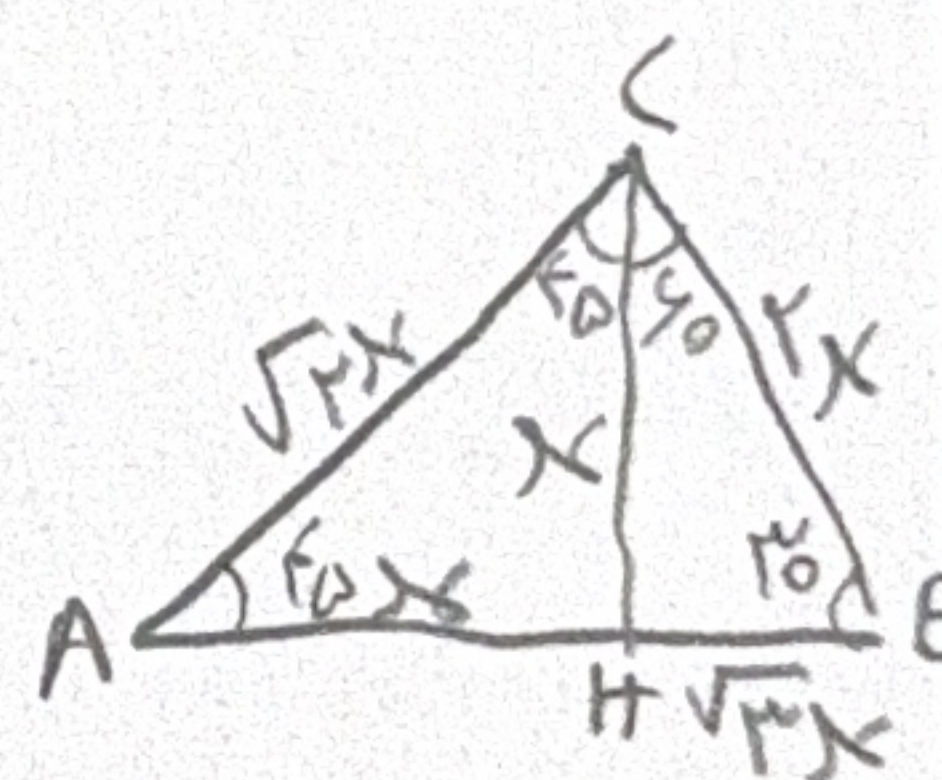
$$\tan 45^\circ = \sqrt{3} \rightarrow BC = 2\sqrt{3} \quad DC \rightarrow 1^2 + 1 = 1^2 \rightarrow DC = \sqrt{13}$$

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

$$AH = CH = x \rightarrow AC^2 = x^2 + x^2 = 2x^2 \rightarrow AC = \sqrt{2}x$$

$$CB = 2x \rightarrow BH^2 = 4x^2 - x^2 = 3x^2 \rightarrow HB = \sqrt{3}x$$

$$\frac{AB}{AC} = \frac{(\sqrt{3}+1)x}{\sqrt{2}x} = \frac{\sqrt{3}+1}{\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}} = \frac{\sqrt{6}+\sqrt{2}}{2}$$



۴

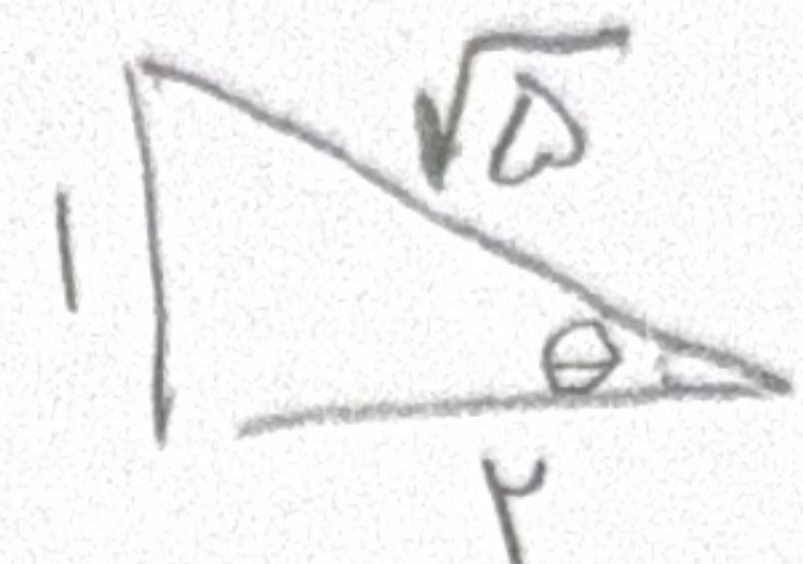
$$\frac{\text{مساحت ABE}}{\text{مساحت BCD}} = \frac{\frac{1}{2} \times \sin \alpha (\text{زاویه بین}) \times 2 \times 4}{\frac{1}{2} \times \sin \alpha (\text{زاویه بین}) \times 12 \times 4} = \frac{1}{11} = \frac{4}{9}$$

۵

$$\frac{1}{4} \times 2 \times \frac{\sqrt{3}}{4} \times 4 \times 3 = 3\sqrt{3}$$

الف

$$\frac{1}{4} \times \frac{\sqrt{3}}{4} \times 4 \times 4 = 3\sqrt{3}$$

$$m = \frac{4-2}{3+1} = \frac{2}{4} = \frac{1}{2} = \tan \theta \rightarrow$$


$$\cos \theta = \frac{\text{مجاور}}{\text{وتر}} = \frac{2}{\sqrt{5}}$$

$$2^2 + 1^2 = 5$$

$$\rightarrow y = x + \frac{5}{4} \rightarrow \tan \alpha = 1 \rightarrow \alpha = 45^\circ$$

$$2y = 2x + 5$$

$$mb = \frac{5}{4} \times \sqrt{3} = \frac{5\sqrt{3}}{4}$$

$$y = mx + b \rightarrow \tan 120^\circ = m \rightarrow -\sqrt{3} \rightarrow y = \frac{5}{4} \rightarrow (0, \frac{5}{4})$$

$$y = \sqrt{3}x + b \rightarrow \frac{5}{4} = 0 + b \rightarrow b = \frac{5}{4}$$

$$f(x) = -\cos x + \cos x + \cot x \rightarrow \cot x = f(x)$$

$$f(150^\circ) = \cot 150^\circ = \frac{-\frac{\sqrt{3}}{4}}{\frac{1}{4}} = -\sqrt{3}$$

$$\frac{\cos x - \sin x}{-\cos x + \sin x} = -1$$

$$-\cos x + \sin x$$