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

$$\left(\frac{\sqrt{2}}{2} - \frac{\sqrt{3}}{2}\right) \left(\frac{\sqrt{2}}{2} - (-\frac{\sqrt{2}}{2})\right) = \frac{1}{2} - \frac{3}{2} = -\frac{1}{2}$$

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

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

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

ب) ضلع روبه روی زاویه 30° وتر است $\frac{\sqrt{3}}{2} = \frac{9}{AC} \rightarrow AC = 6\sqrt{3}$

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

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

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

ب)

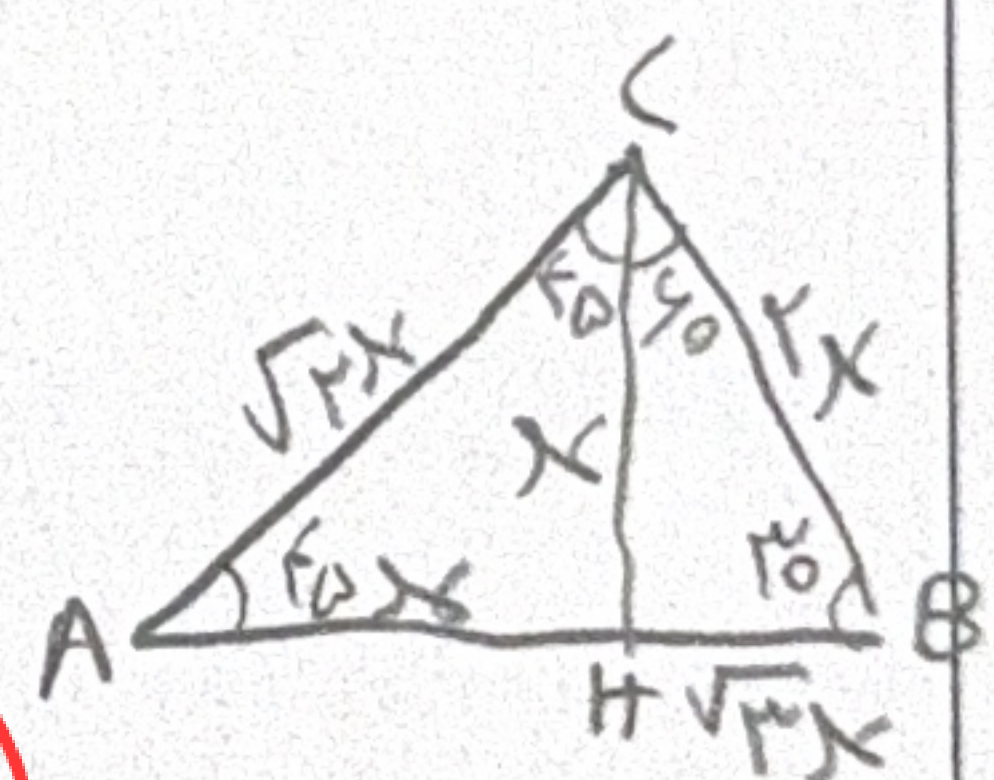
$$\tan 45^\circ = \sqrt{3} \rightarrow BC = 2\sqrt{3} \quad DC \rightarrow 1^2 + 1 = 1^2 \rightarrow DC = \sqrt{1^2 + 1^2} = \sqrt{2}$$

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

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

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

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



$$\frac{\text{مساحت ABE}}{\text{مساحت BCD}} = \frac{\frac{1}{2} \times \sin \alpha (\text{زاویه بین}) \times 2 \times 4}{\frac{1}{2} \times \sin \alpha (\text{زاویه بین}) \times 12 \times 4} = \frac{1}{3} = \frac{4}{12}$$

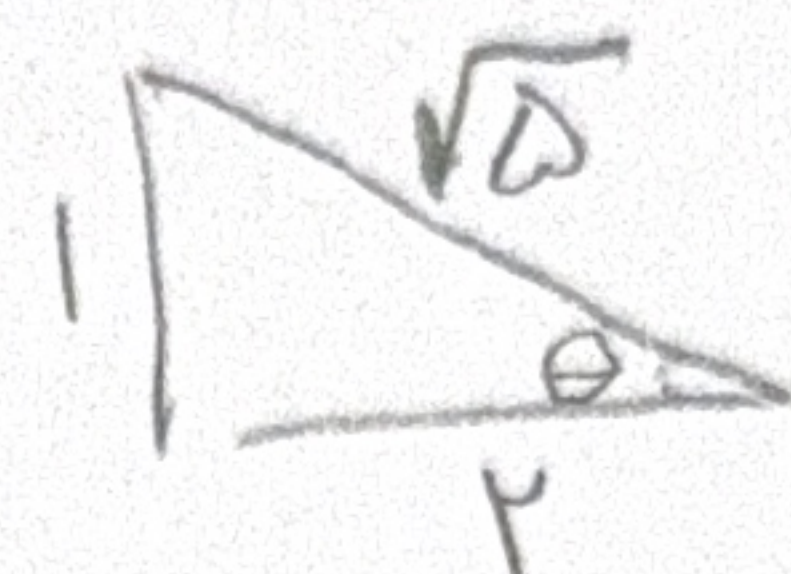
$$\frac{1}{\sqrt{3}} \times 2 \times \frac{\sqrt{3}}{2} \times 2 \times 3 = 4\sqrt{3} \checkmark$$

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

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



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

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

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$$y = x + \frac{5}{2} \rightarrow \tan \alpha = 1 \rightarrow \alpha = 45^\circ$$

$$2y = 2x + 5$$

$$mb = \frac{5}{2} \times \sqrt{3} = \frac{5\sqrt{3}}{2}$$

$$y = mx + b \rightarrow \tan 135^\circ = m \rightarrow -\sqrt{3} \rightarrow y = \frac{5}{2} \rightarrow (0, \frac{5}{2})$$

$$y = \sqrt{3}x + b \rightarrow \frac{5}{2} = 0 + b \rightarrow b = \frac{5}{2}$$

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

$$f(150^\circ) = \cot 150^\circ = \frac{-\frac{\sqrt{3}}{2}}{\frac{1}{2}} = -\sqrt{3} \checkmark$$

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

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