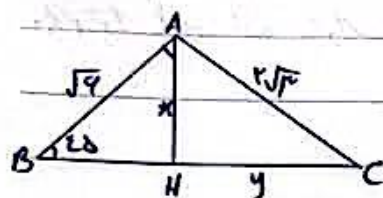


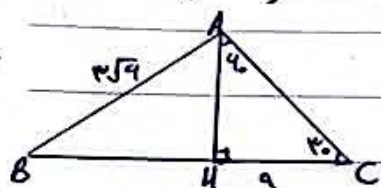
۱- الف) $(\sin 135^\circ + \sin 30^\circ)(\cos 135^\circ - \cos 15^\circ) = \left(\frac{\sqrt{2}}{2} + \frac{1}{2}\right)\left(\frac{\sqrt{2}}{2} - \frac{\sqrt{3}}{2}\right) = \frac{(\sqrt{2}-\sqrt{3})(\sqrt{2}+\sqrt{3})}{4} = \frac{2-3}{4} = -\frac{1}{4}$

ب) $\frac{1 + 3 \tan^2 21^\circ}{2 \cos^2 21^\circ + 2 \cos^2 24^\circ} = \frac{1 + 3 \left(\frac{\sqrt{3}}{4}\right)^2}{2 \left(\frac{\sqrt{3}}{4}\right)^2 + 2 \left(\frac{\sqrt{3}}{4}\right)^2} = \frac{1+1}{2} = \frac{2}{2} = 1$



$x\sqrt{2} = \sqrt{4} \Rightarrow x = \sqrt{2} \Rightarrow AH = BH$

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

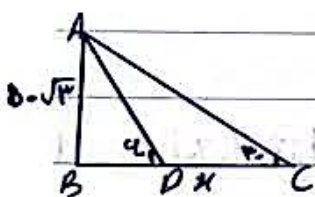


$\sin 40^\circ \cdot \frac{\sqrt{3}}{2} = \frac{4 \times 2}{\sqrt{3}} \Rightarrow \frac{1}{\sqrt{3}} \times \frac{\sqrt{3}}{2} \times \sqrt{3} = AC$

$AH^2 + CH^2 = (4\sqrt{3})^2 = 16 \Rightarrow 2 + AH^2 = 16 \Rightarrow AH^2 = 14 \Rightarrow AH = \sqrt{14}$

$\sin B \cdot \frac{AH}{AB} = \frac{4\sqrt{3}}{3\sqrt{4}} \Rightarrow \frac{\sqrt{3}}{2} \times \frac{\sqrt{4}}{\sqrt{4}} = \frac{\sqrt{3}}{2} \Rightarrow \sqrt{3} = \sqrt{3}$

BC نه فی تواندا؛ AC بیشتر باشت

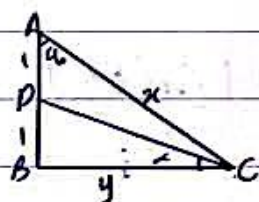


$\sin 30^\circ \cdot \frac{1}{2} \Rightarrow AC = 2 \times 5\sqrt{3} = 10\sqrt{3}$

$\sin 40^\circ \cdot \frac{\sqrt{3}}{2} \Rightarrow AD = 2 \times 5\sqrt{3} = 10$

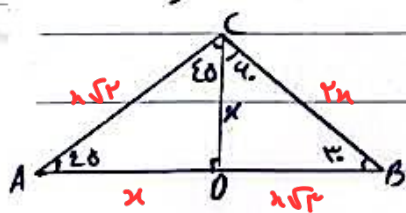
$CD = BC - BD = 10 - 5 = 5$

$BC = \sqrt{3} \times 10 = 10\sqrt{3} \Rightarrow CD = 10\sqrt{3} - 5 = 10$



$\cos 40^\circ \cdot \frac{AB}{AC} = \frac{1}{2} \Rightarrow \frac{1}{2} \times \frac{2}{x} = \frac{1}{2} \Rightarrow AC = 2$

$DC^2 = BD^2 + BC^2 \Rightarrow DC = \sqrt{1^2 + 1^2} = \sqrt{2} \Rightarrow \sin 40^\circ = \frac{BD}{CD} = \frac{1}{\sqrt{2}} \Rightarrow \frac{\sqrt{2}}{2} = \frac{1}{\sqrt{2}}$

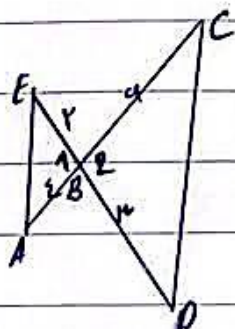


$CD = AD = x \Rightarrow AC = 2\sqrt{2}$

$\sin 40^\circ = \frac{\sqrt{2}}{2} = \frac{BD}{BC} \Rightarrow BD = \sqrt{2} \Rightarrow AC = \frac{2\sqrt{2}}{1 + \sqrt{2}} = \frac{2\sqrt{2}}{1 + \sqrt{2}}$

$\frac{\sqrt{2}}{1 + \sqrt{2}} \times \frac{1 - \sqrt{2}}{1 - \sqrt{2}} = \frac{\sqrt{2} - 2}{1 - 2} = \frac{2 - \sqrt{2}}{1}$

$\frac{2(1 + \sqrt{2})}{2\sqrt{2}} = \frac{1 + \sqrt{2}}{\sqrt{2}} = \frac{1 + \sqrt{2}}{\sqrt{2}}$



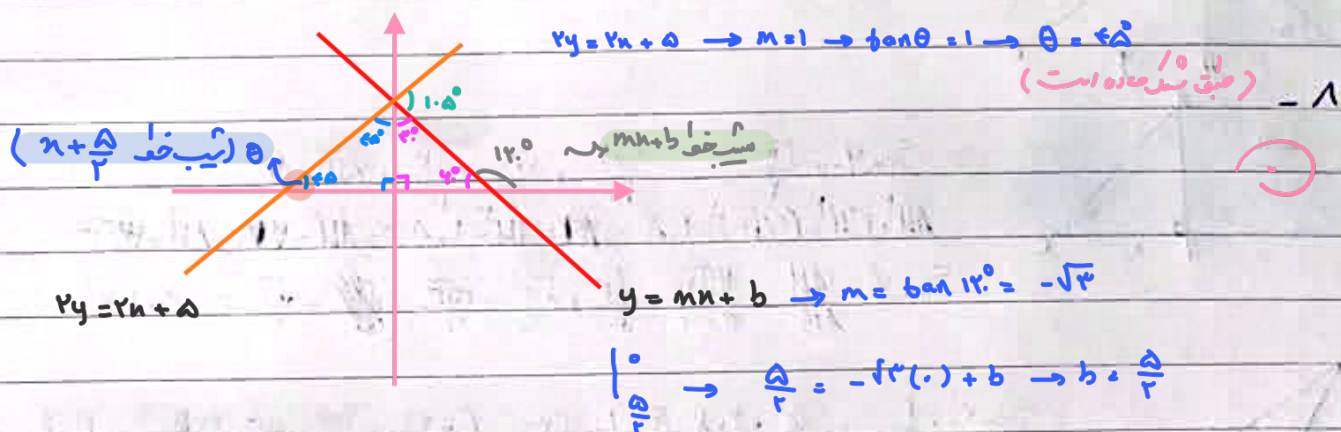
$S_{EBA} = \frac{1}{2} \times EB \times BA \times \sin B_1$

$\frac{S_{ABE}}{S_{BCD}} = \frac{EB \times AB}{BC \times BD} = \frac{2 \times 2}{4 \times 2} = \frac{1}{2}$

$$S_{ABCD} = \frac{1}{4} \times 2 \times AB \times AD \times \sin \alpha = AB \times AD \times \sin \alpha \Rightarrow 3 \times 2 \times \sin 120^\circ = 3 \times 2 \times \frac{\sqrt{3}}{2} = 9\sqrt{3} \quad \text{الف) 4}$$

$$2 \times \frac{1}{4} \times AB \times AC \times \sin \alpha \Rightarrow 2 \times \frac{1}{4} \times 2 \times \frac{1}{4} \times \sin 120^\circ = 2 \times \frac{1}{4} \times \frac{1}{4} \times 2 \times \frac{\sqrt{3}}{2} = \frac{\sqrt{3}}{4} \quad \text{ب) از ضلع اوجش بالا برست آره}$$

$$\cos \theta = \frac{\text{مجاور}}{\text{مایل}} = \frac{\Delta x}{\sqrt{\Delta x^2 + \Delta y^2}} \Rightarrow \frac{\Delta x}{\sqrt{\Delta x^2 + \Delta y^2}} = \frac{3 - (-1)}{\sqrt{(3+1)^2 + (2-1)^2}} = \frac{4}{\sqrt{14+1}} = \frac{4}{\sqrt{15}} = \frac{4}{\sqrt{3} \times \sqrt{5}} = \frac{4}{\sqrt{3}} \times \frac{\sqrt{5}}{\sqrt{5}} = \frac{4\sqrt{5}}{3\sqrt{3}} \quad \text{ج) 7}$$



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

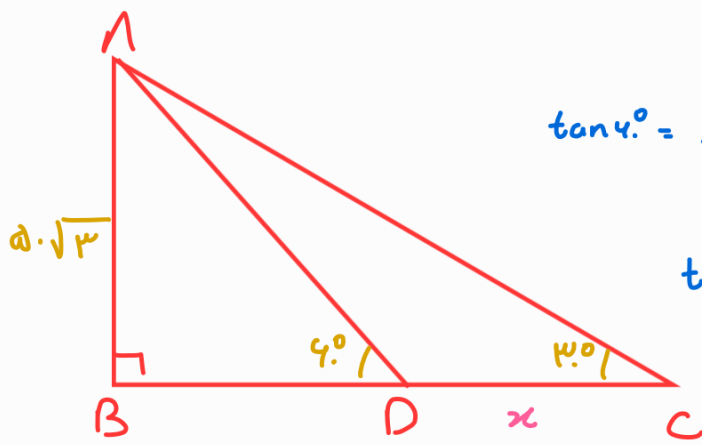
$$f\left(\frac{\delta x}{a}\right) = \cos\left(x + \frac{\delta x}{a}\right) + \sin\left(\frac{x}{2} - \frac{\delta x}{a}\right) - \tan\left(\frac{3x}{2} + \frac{\delta x}{a}\right) = \cos\left(\frac{\delta x}{a}\right) - \cos\left(\frac{\delta x}{a}\right) + \cos\left(\frac{\delta x}{a}\right) - 1$$

$$+\cos\left(\frac{\delta x}{a}\right) = +\frac{\cos 10^\circ}{\sin 10^\circ} = \frac{\frac{\sqrt{3}}{2}}{\frac{1}{2}} = \sqrt{3}$$

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

$$\frac{\sin\left(\frac{x}{2} + x\right) + \cos\left(\frac{3x}{2} - x\right)}{\cos(x + x) - \sin(2x - x)}$$

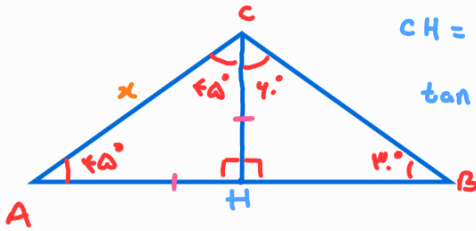
3- الف



$$\tan 40^\circ = \frac{AB}{BD} \rightarrow BD = \frac{a \cdot \sqrt{3}}{\sqrt{3}} = a.$$

$$\tan 10^\circ = \frac{AB}{BC} \rightarrow BC = \frac{a \cdot \sqrt{3}}{\frac{1}{\sqrt{3}}} = 1a.$$

$$BD = 100$$



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

$$\tan 10^\circ = \frac{CH}{BH} \rightarrow BH = \frac{\frac{x\sqrt{2}}{2}}{\frac{1}{\sqrt{3}}} = \frac{x\sqrt{6}}{2} \rightarrow AB = x\left(\frac{\sqrt{4}}{2} + \frac{\sqrt{2}}{2}\right)$$

$$\frac{AB}{AC} = \frac{x\left(\frac{\sqrt{4}}{2} + \frac{\sqrt{2}}{2}\right)}{x} = \frac{\sqrt{4} + \sqrt{2}}{2}$$

9

$$\underbrace{(\pi + \pi)}_{-C \cdot \sin} + \underbrace{\sin\left(\frac{\pi}{2} - \pi\right)}_{C \cdot \sin} - \tan\left(\frac{\pi}{2} + \pi\right)$$

$$-C \cdot \sin + C \cdot \sin + \cot \pi$$

$$\varphi_n = \cot \pi \rightarrow \varphi\left(\frac{\omega \pi}{4}\right) = \cot\left(\frac{\omega \pi}{4}\right) = -\sqrt{3}$$