

گروه دهم دفتر ۳

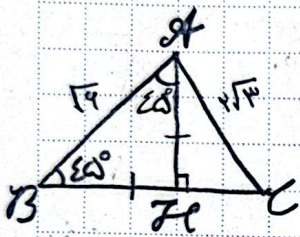
تکلیف ۲۰

سایه داودی

$$(1) \quad (\sin 135^\circ + \sin 30^\circ)(\cos 135^\circ - \cos 15^\circ) = \sin^2 135^\circ - \sin^2 30^\circ$$

$$\left(\frac{\sqrt{2}}{2}\right)^2 - \left(-\frac{\sqrt{3}}{2}\right)^2 = \frac{2}{4} - \frac{3}{4} = -\frac{1}{4}$$

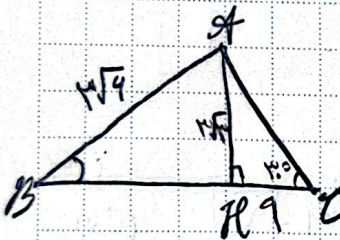
$$(2) \quad \frac{1 + 3 \tan^2 45^\circ}{2 \cos^2 30^\circ + 2 \cos^2 45^\circ} = \frac{1 + 3 \left(\frac{1}{1}\right)^2}{2 \left(\frac{\sqrt{3}}{2}\right)^2 + 2 \left(\frac{\sqrt{2}}{2}\right)^2} = \frac{1 + 3 \left(\frac{1}{1}\right)}{2 \left(\frac{3}{4}\right) + 2 \left(\frac{2}{4}\right)} = \frac{4}{\frac{3}{2} + 1} = \frac{4}{\frac{5}{2}} = \frac{8}{5}$$



در مثل متساوی الساقین
دور $a\sqrt{2}$ است
 $a = \sqrt{3}$

$$AC = \sqrt{3}$$

(الف)



ضلع مجاور 30°
دور $\frac{\sqrt{3}}{2}$ است

$$AC = \frac{\sqrt{3}}{2} AB$$

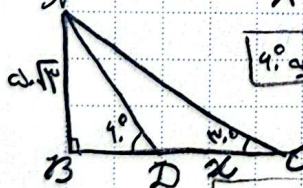
$$1 = \frac{\sqrt{3}}{2} AB \rightarrow AB = \frac{2}{\sqrt{3}} = \frac{2\sqrt{3}}{3}$$

★ ردیف آسانتر: $\tan 30^\circ$
ضلع مقابل 30°
 $\frac{1}{2}$ ضلع مجاور است.

ضلع مقابل 30°
دور $\frac{1}{2}$ است

$$AB = \frac{1}{2} AC \rightarrow AB = \frac{1}{2} \times \frac{2\sqrt{3}}{3} = \frac{\sqrt{3}}{3}$$

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



★ زاویه 45°

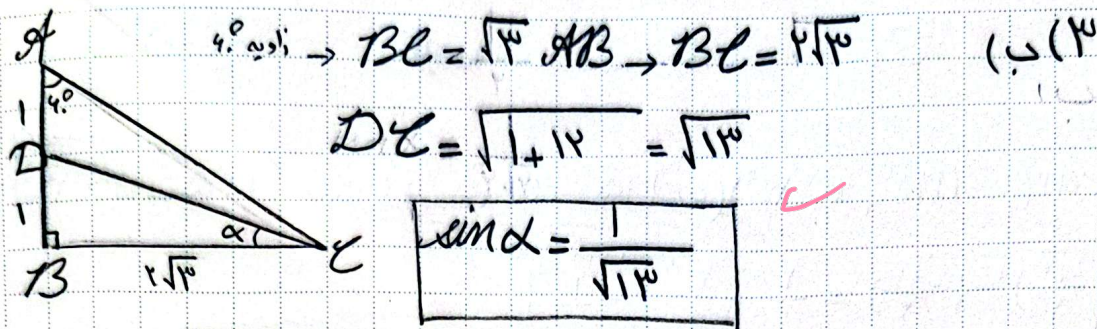
$$AB = \frac{\sqrt{3}}{2} AD \rightarrow AD = \frac{2 \times \sqrt{3} \times 2}{\sqrt{3}} = 100$$

$$AB = \frac{1}{2} AC \rightarrow AC = \frac{2 \times \sqrt{3} \times 2}{1} = 100\sqrt{3}$$

$$BD = \frac{1}{2} AD \rightarrow BD = \frac{1 \times 100}{2} = 50$$

$$BC = \frac{\sqrt{3}}{2} AC \rightarrow BC = \frac{100\sqrt{3} \times \sqrt{3}}{2} = 150$$

$$BC - BD = x \rightarrow 150 - 50 = 100 \rightarrow x = 100$$



$\frac{AB}{AC} = \frac{c}{b} \Rightarrow \frac{c}{\sqrt{c^2 - \sqrt{3}a}} = \frac{\sqrt{3}c}{\sqrt{c^2 - \sqrt{3}a}} = \frac{\sqrt{3} + \sqrt{4}}{\sqrt{3} + \sqrt{4}} \quad (ع)$

$\frac{c}{b} = \frac{\sqrt{3} + \sqrt{4}}{\sqrt{3}}$

$a \cos B + b \cos A = c \rightarrow b = \frac{c - a \cos(30^\circ)}{\cos(45^\circ)} = \frac{c - \frac{\sqrt{3}}{2}a}{\frac{\sqrt{2}}{2}} = \frac{2c - \sqrt{3}a}{\sqrt{2}}$

$\frac{S_{ABE}}{S_{BCD}} = \frac{\frac{1}{2} \times 4 \times \varepsilon \times \sin B_1}{\frac{1}{2} \times 3 \times \frac{4}{3} \times \sin B_2} = \frac{\varepsilon}{9} \quad (د)$

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

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

$y = ax + b \quad b_1 = b_2$

$-y = -1a + b_1 \rightarrow y = \varepsilon a \rightarrow a = \frac{1}{\varepsilon} \rightarrow \tan \theta = \frac{1}{\varepsilon}$

$\varepsilon = 3a + b_1$

$\cos \theta = \frac{\varepsilon}{\sqrt{5}}$

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

$y = 2x + a \Rightarrow y = 2x + \frac{a}{2}$

$y = mx + b$

$b = \frac{a}{2} \rightarrow$ محل قطع کردن محور y ها با عرض ا را میباید

$140 - (75 + 45) = 20^\circ \rightarrow$ زاویه تشکیل شده با محور x ها $= 140 - 40 = 100^\circ$

$\tan 14^\circ = \sqrt{3} = m$

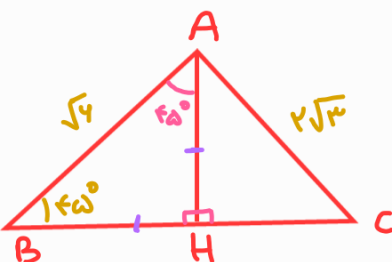
$mb = \sqrt{3} \times \frac{a}{2} = \frac{a\sqrt{3}}{2}$

$$f(x) = \underbrace{\cos(\pi+x)}_{=-\cos x} + \underbrace{\sin\left(\frac{\pi}{4}-x\right)}_{=\cos x} - \overbrace{\tan\left(\frac{5\pi}{4}+x\right)}^{=\cot x} \Rightarrow f(x) = \cot x \quad (9)$$

$$f(x) = \cot x \rightarrow f\left(\frac{2\pi}{4}\right) = \cot(150^\circ) \rightarrow f\left(\frac{2\pi}{4}\right) = \boxed{-\sqrt{3}} \quad (10)$$

$$\frac{\sin\left(\frac{\pi}{4}+x\right) + \cos\left(\frac{15\pi}{4}-x\right)}{\cos\left(\frac{5\pi}{4}+x\right) - \sin\left(\frac{9\pi}{4}-x\right)} = \frac{\sin\left(\frac{\pi}{4}+x\right) + \cos\left(\frac{7\pi}{4}-x\right)}{\cos(\pi+x) - \sin(2\pi-x)} =$$

$$\frac{\cos x - \sin x}{-\cos x + \sin x} = \frac{\cos x - \sin x}{-(\cos x - \sin x)} = \boxed{-1} \quad (11)$$

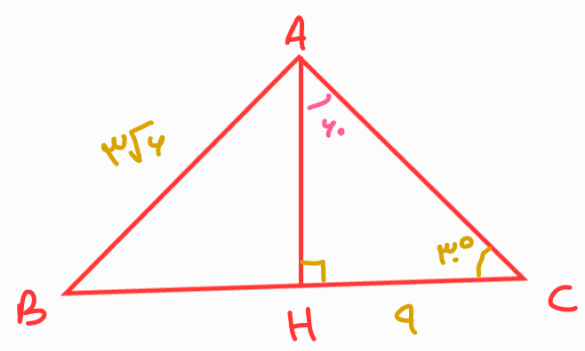


$$AH^2 + BH^2 = 4 \quad AH = BH \rightarrow AH = \sqrt{3}$$

$$\sin \hat{C} = \frac{AH}{2\sqrt{3}} = \frac{1}{2} \rightarrow \hat{C} = 30^\circ$$

$$\cos 30^\circ = \frac{HC}{2\sqrt{3}} \rightarrow HC = 2\sqrt{3} \left(\frac{\sqrt{3}}{2} \right) = \boxed{3}$$

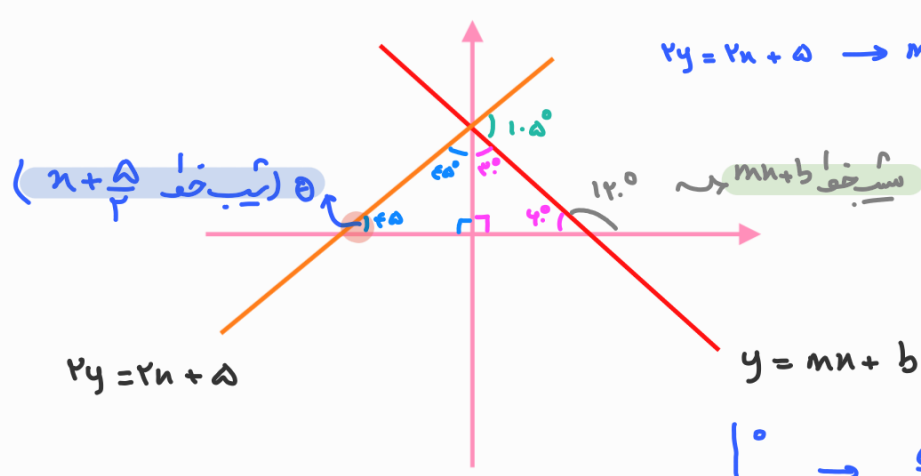
الف)



$$\tan 45^\circ = \frac{AH}{9} \rightarrow AH = 9 \left(\frac{\sqrt{3}}{2} \right) = 3\sqrt{3}$$

$$\sin \hat{B} = \frac{3\sqrt{3}}{9\sqrt{4}} \rightarrow \sin \hat{B} = \frac{\sqrt{12}}{6} = \frac{\sqrt{3}}{2} \rightarrow \boxed{\hat{B} = 60^\circ}$$

ب)



$$2y = 2x + 5 \rightarrow m = 1 \rightarrow \tan \theta = 1 \rightarrow \theta = 45^\circ$$

(طبق سطر داده است)

$$y = mx + b \rightarrow m = \tan 12^\circ = -\sqrt{3}$$

$$\left| \begin{matrix} 1 & 0 \\ 0 & 1 \end{matrix} \right| \rightarrow \frac{5}{2} = -\sqrt{3}(\cdot) + b \rightarrow b = \frac{5}{2}$$

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