★ ۱۹٫۷۵ آفرین (ش)

Year. Month. Date. ( )

الیا یادگاری — دهم دفتر B — تکلیف ۲

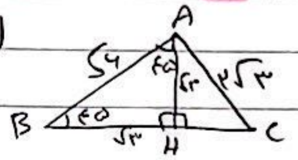
۱) الف) $(\sin 135 + \sin 300)(\cos 315 - \cos 150) = \left(\frac{\sqrt{2}}{2}\right)^2 - \left(\frac{\sqrt{3}}{2}\right)^2 = \frac{1}{2} - \frac{3}{4} = -\frac{1}{4}$

$\sin 135 = \frac{\sqrt{2}}{2}$ ، $\sin 300 = -\frac{\sqrt{3}}{2}$ ، $\cos 315 = -\frac{\sqrt{2}}{2}$ ، $\cos 150 = -\frac{\sqrt{3}}{2}$

ب) $\frac{1+3\tan^2 210}{4\cos^2 330 + 2\cos^2 225}$ ، $\tan 210 = \frac{-\frac{1}{2}}{-\frac{\sqrt{3}}{2}} = \frac{1}{\sqrt{3}}$ ، $\cos 330 = \frac{\sqrt{3}}{2}$ ، $\cos 225 = -\frac{\sqrt{2}}{2}$ ۲

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

۲) الف)

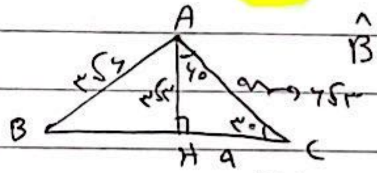


$CH = ?$ $AH = a$ $AB = a\sqrt{2}$ $AH = \sqrt{3}$

$CH^2 = AC^2 - AH^2 \rightarrow (2\sqrt{3})^2 - (\sqrt{3})^2 = 12 - 3 = 9$

$CH = \sqrt{9} = 3$

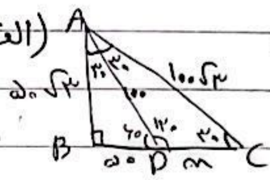
ب)



$\hat{B} = ?$ $\frac{\sqrt{3}}{2} \times x = 9$ $x = \frac{9}{\frac{\sqrt{3}}{2}} = \frac{18}{\sqrt{3}} = 6\sqrt{3}$ ۲

$\sin \hat{B} = \frac{AH}{AB} \rightarrow \frac{3\sqrt{3}}{3\sqrt{6}} \times \frac{\sqrt{6}}{\sqrt{6}} = \frac{3\sqrt{2}}{6} = \frac{\sqrt{2}}{2} \rightarrow 45$ ، $135 \, x$

۳) الف)

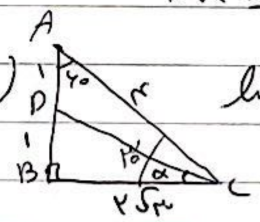


$x = ?$ $\sin 60 = \frac{\sqrt{3}}{2} = \frac{AB}{AD} = \frac{50\sqrt{3}}{?} \rightarrow 100$

$\frac{AB}{AC} = \frac{1}{2} = \frac{50\sqrt{3}}{AC} \rightarrow 100\sqrt{3}$ $(100\sqrt{3})^2 - (50\sqrt{3})^2 = 30000 - 7500 = \sqrt{22500}$ = ۱۵۰

$x = 150 - 50 = 100$ جواب

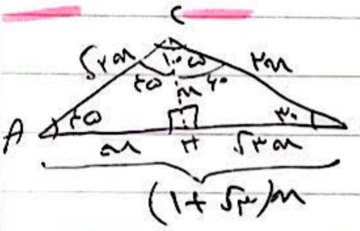
ب)



$\sin\alpha = ?$ $\sin 60 = \frac{\sqrt{3}}{2} = \frac{BC}{AC} \rightarrow BC = 2\sqrt{3}$ ۲

$DC = \sqrt{BC^2 + BD^2} = \sqrt{12+1} = \sqrt{13}$ $\sin\alpha = \frac{BD}{DC} = \frac{1}{\sqrt{13}} = \frac{\sqrt{13}}{13}$

۴)



$\frac{AB}{AC} = ?$ $x = \frac{\sqrt{2}}{2} AC = \sqrt{2}x$ ۲

$\sin 60 = \frac{\sqrt{3}}{2} = \frac{HB}{CB} = \frac{\sqrt{3}x}{2x}$ $\frac{AB}{AC} = \frac{(1+\sqrt{3})x}{\sqrt{2}x} = \frac{1+\sqrt{3}}{\sqrt{2}} = \frac{\sqrt{2}+\sqrt{6}}{2}$

۵) $\frac{S_{ABE} = \frac{1}{2} \times 2 \times 4 \times \sin\alpha}{S_{BCD} = \frac{1}{2} \times 6 \times 3 \times \sin\alpha} = \frac{8}{18} = \frac{4}{9}$ ۲

BERKEH

۶) ب) $\frac{1}{2}\times 3\times 4\times \sin 120 = 3\sqrt{3}$ ✓ ۲

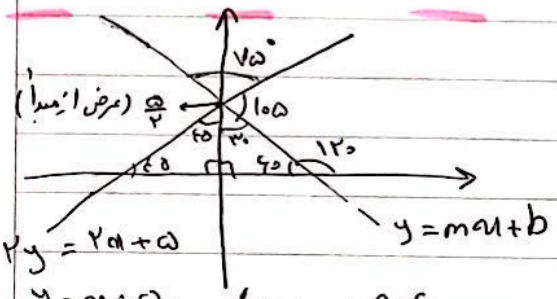
الف) $2\times\frac{1}{2}\times 3\times 4\times \underbrace{\sin 120}_{\frac{\sqrt{3}}{2}} = 6\sqrt{3}$ ✓

۷) $y=ax+b \longrightarrow y=\frac{1}{2}x+b \quad \tan\theta=\frac{1}{2} \quad 1+\tan^2=\frac{1}{\cos^2}$

$\cos = \begin{cases} \frac{2}{\sqrt{5}} & \checkmark \\ -\frac{2}{\sqrt{5}} & \times \end{cases}$ ✓ ۲

شیب $= \frac{y_Q - y_P}{x_Q - x_P} = \frac{2}{4} = \frac{1}{2}$

۸) $\tan 120 = \frac{\sqrt{3}}{-\frac{1}{2}} = -\sqrt{3}$



$y=-\sqrt{3}x+b \quad \frac{\omega}{2}=-\sqrt{3}(0)+b$ ✓ ۲

$m=-\sqrt{3} \quad b=\frac{\omega}{2} \quad mb=-\frac{\omega\sqrt{3}}{2}$

۹) $\frac{\omega\pi}{6}=150=\alpha \quad \cos(\pi+\alpha)+\sin(\frac{\pi}{2}+150)-\tan(3\frac{\pi}{2}+150)$

$-\cos\alpha - (-\cos\alpha) + (-\cot 30) = +\cot 30 = \sqrt{3}$ ✓

$\cot 150 = \frac{-\sqrt{3}}{\frac{1}{2}} = -\sqrt{3}$

۱۰) $\frac{\sin(\frac{17\pi}{2}+\alpha)+\cos(\frac{15\pi}{2}-\alpha)}{\cos(3\pi+\alpha)-\sin(4\pi-\alpha)} = \frac{\cos\alpha-\sin\alpha}{-\cos\alpha+\sin\alpha} =$ ✓ ۲

$\frac{\cos\alpha-\sin\alpha}{-(\cos\alpha-\sin\alpha)} = -1$ ✓

۹ —

$\underbrace{(\pi+x)}_{-\cos x} + \underbrace{\sin(\frac{\pi}{2}-x)}_{+\cos x} - \underbrace{\tan(\frac{3\pi}{2}+x)}_{+\cot x}$

$f(x)=\cot x \longrightarrow f(\frac{\omega\pi}{4})=\cot(\frac{\omega\pi}{4})=-\sqrt{3}$