باران ابراهیمی . درس ۲ دفتر تکلیف

الف)

$(\sin 120 + \sin 300)(\cos 210 - \cos 150)$

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

$= -\frac{1}{4}$

باران ابراهیمی

ب)

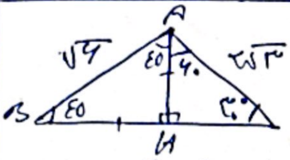
$\frac{1 + 3\tan^2 210}{4\cos^2 240 + 2\cos^2 330} =$

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

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

$3 + 1 = 4 \qquad \frac{2}{4} = \frac{1}{2}$

الف)



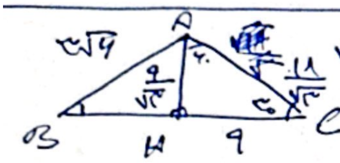
$AH = \frac{\sqrt{3}}{2} \times \sqrt{6} = \frac{\sqrt{18}}{2}$

$\sin\theta \times 2\sqrt{3} = \frac{\sqrt{18}}{2}$

$\sin\theta = \frac{\frac{\sqrt{18}}{2}}{2\sqrt{3}} = \frac{1}{2} \Rightarrow \theta = 30^\circ$

$HC = 2\sqrt{3} \times \frac{\sqrt{3}}{2} = 3$

ب)



$\frac{\sqrt{3}}{2} x = 9 \quad x = \frac{9}{\frac{\sqrt{3}}{2}} = \frac{18}{\sqrt{3}}$

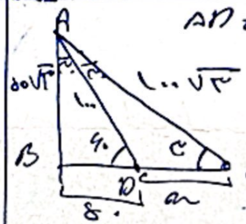
$AH = \frac{1}{2} \times \frac{18}{\sqrt{3}} = \frac{9}{\sqrt{3}}$

$\sin B \times 3\sqrt{6} = \frac{9}{\sqrt{3}}$

$\sin B = \frac{\frac{3}{\sqrt{3}}}{\frac{1 \times \sqrt{6}}{1}} = \frac{3}{\sqrt{18}}$

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

الف)



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

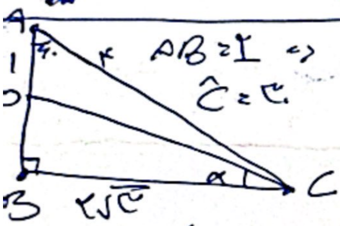
$BD = 50$

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

$150 - 50 = 100$

$x = DC$

ب)



$AB = 1 \Rightarrow AC = 2$

$\hat{C} = 30$

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

$\sin\alpha = \frac{BD}{DC}$

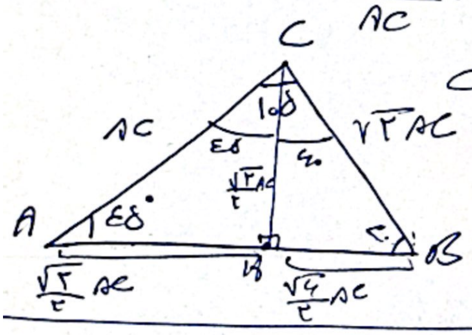
$DC^2 = (1)^2 + (2\sqrt{3})^2 = 1 + 12 = 13 \Rightarrow DC = \sqrt{13}$

$\sin\alpha = \frac{\frac{\sqrt{13}}{1}}{2\sqrt{3}} = \frac{\sqrt{13}}{2\sqrt{3}}$

ج)

$\frac{AB}{AC} = ?$

$CH = \frac{\sqrt{2}}{2} AC \qquad AH = \frac{\sqrt{2}}{2} AC$



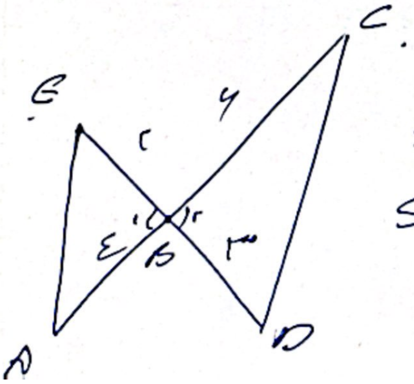
$CB = \frac{\sqrt{2}}{2} AC \times 2 = \sqrt{2} AC \qquad BH = \frac{\sqrt{3}}{2} \times \sqrt{2} AC = \frac{\sqrt{6}}{2} AC$

$BA = \frac{\sqrt{2}}{2} AC + \frac{\sqrt{6}}{2} AC = \frac{\sqrt{2} + \sqrt{6}}{2} AC$

$\frac{AB}{AC} = \frac{\frac{\sqrt{2}+\sqrt{6}}{2} AC}{AC} = \frac{\sqrt{2}+\sqrt{6}}{2}$

د)

متقابل به رأس $\hat{B}_1 = \hat{B}_2$

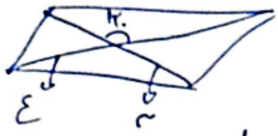


$S_{ABE} = \frac{1}{2} \times 2 \times 4 \times \sin B_1$

$S_{BCD} = \frac{1}{2} \times 6 \times 3 \times \sin B_2$

$\frac{S_{ABE}}{S_{BCD}} = \frac{2 \times 4}{6 \times 3} = \frac{4}{9}$

ب)



$S = \frac{1}{2} ab \sin\alpha$

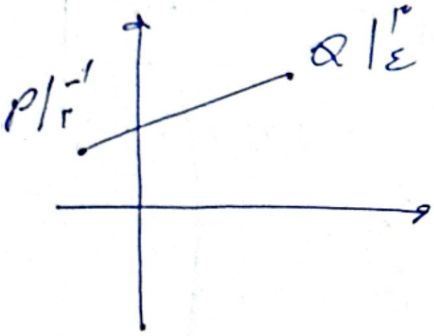
$\frac{1}{2} \times 4 \times 6 \times \sin 120 =$

$\frac{1}{2} \times 4 \times 6 \times \frac{\sqrt{3}}{2} = 6\sqrt{3}$

الف)

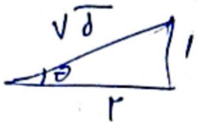
$S = \frac{1}{2} ab \sin\alpha$

$\frac{1}{2} \times 3 \times 4 \times \frac{\sqrt{3}}{2} = 3\sqrt{3} \times 2 = 6\sqrt{3}$

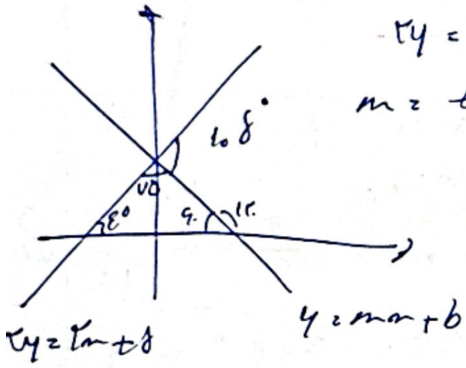


$\tan\theta = m$ $\quad m = \frac{\Delta y}{\Delta x} = \frac{4-2}{3+1} = \frac{2}{4} = \frac{1}{2}$

$\tan\theta = \frac{1}{2}$



$\cos\theta = \frac{2}{\sqrt{5}}$



$2y = 2x + 5 \Rightarrow y = x + \frac{5}{2}$ $\quad m = 1$ $\quad \tan\theta = 1$ $\quad \theta = 45°$

$m = \tan 120 \Rightarrow -\sqrt{3} \Rightarrow y = -\sqrt{3}x + b$

عرض از مبدأها برابر چون روی محور yها همدیگر را قطع کرده‌اند:

$b = 5$

$y = -\sqrt{3}x + 5$

$x_h = \frac{5\sqrt{3}}{2}$

$f\left(\frac{5\pi}{6}\right) = \cos\left(\pi + \frac{5\pi}{6}\right) + \sin\left(\frac{\pi}{2} - \frac{5\pi}{6}\right) - \tan\left(\frac{3\pi}{2} + \frac{5\pi}{6}\right)$

$\cos(330) + \sin(300) - \tan(60)$

$\frac{\sqrt{3}}{2} - \frac{\sqrt{3}}{2} - \sqrt{3} = -\sqrt{3}$

$\Rightarrow \frac{\sin\left(\frac{\pi}{2} + x\right) + \cos\left(\frac{3\pi}{2} - x\right)}{\cos(\pi + x) - \sin(-x)} = \frac{\cos(x) - \sin(x)}{-\cos(x) + \sin x} = -1$