نگار فلاح

[illegible] : ۲۰

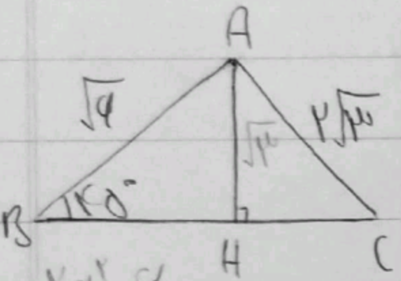
۱) الف) $(\sin 135^\circ + \sin 300^\circ)(\cos 315^\circ - \cos 150^\circ) =$

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

ب) $\frac{1 + 3\tan^2 210^\circ}{4\cos^2 330^\circ + 2\cos^2 225^\circ} = \frac{2}{4} = \frac{1}{2}$

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

۲) الف)



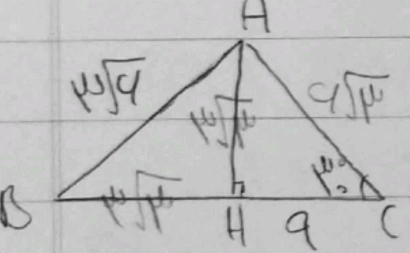
$HC^2 = 12 - 3 = 9$

$HC = 3$

$2x^2 = 6$

$x^2 = 3 \quad x = \sqrt{3}$

ب)

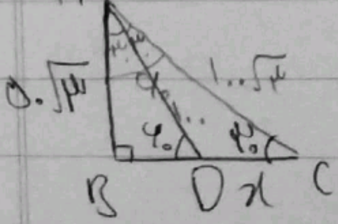


$AH = BH \Rightarrow \hat{A} = \hat{B} = 45^\circ$

$\cos 30^\circ = \frac{\sqrt{3}}{2} \quad AC = 9 \div \frac{\sqrt{3}}{2} = 6\sqrt{3}$

$54 - 27 = 27 \Rightarrow BH = 3\sqrt{3}$

۳) الف)



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

$50\sqrt{3} \div \frac{1}{2} = 100\sqrt{3}$

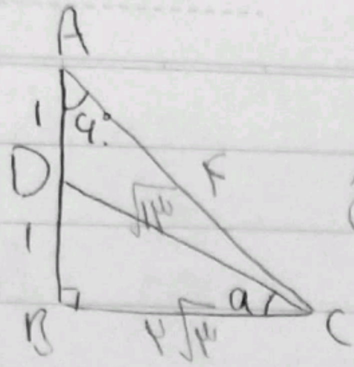
$30000 - 7500 = 22500$

$x = 150 - 50 = 100 \quad BC = 150$

$10000 - 7500 = 2500$

$BD = 50$

ب)



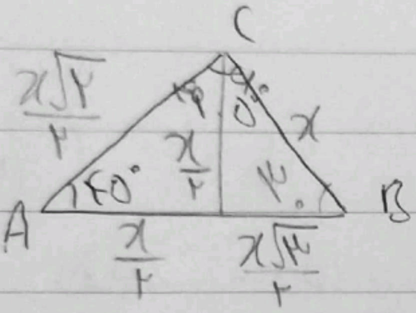
$\hat{C} = ۳۰^\circ \quad AC = ۲ \div \frac{۱}{۲} = ۴$

$۱۶ - ۴ = ۱۲ \quad BC = ۲\sqrt{۳}$

$۱ + ۱۲ = ۱۳$

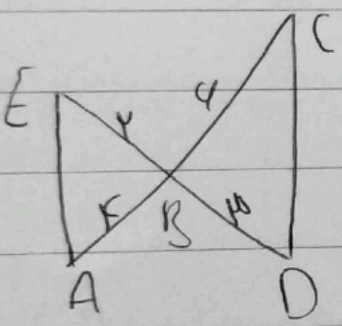
$CD = \sqrt{۱۳} \qquad \sin a = \frac{BD}{CD} = \frac{\sqrt{۱۳}}{۱۳}$

۴)



$\frac{AB}{AC} = \frac{\frac{x(۱+\sqrt{۳})}{۲}}{\frac{x\sqrt{۲}}{۲}} = \frac{\sqrt{۲}(۱+\sqrt{۳})}{۲}$

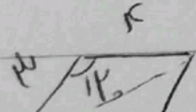
۵)



$\frac{S_{ABE}}{S_{BCD}} = \frac{\frac{۱}{۲} \times ۲ \times ۴}{\frac{۱}{۲} \times ۶ \times ۳} = \frac{۴}{۹}$

۶)

الف)

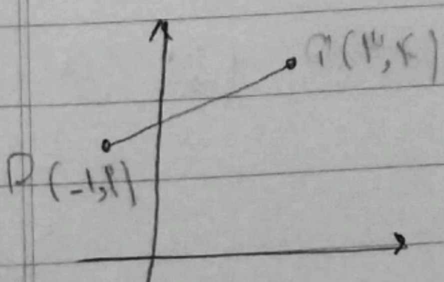


$ab \sin a = ۳ \times ۴ \times \frac{\sqrt{۳}}{۲} = ۶\sqrt{۳}$

ب)

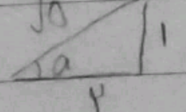
$\frac{۱}{۲} ab \sin a = \frac{۱}{۲} \times ۳ \times ۴ \times \frac{\sqrt{۳}}{۲} = ۳\sqrt{۳}$

۷)

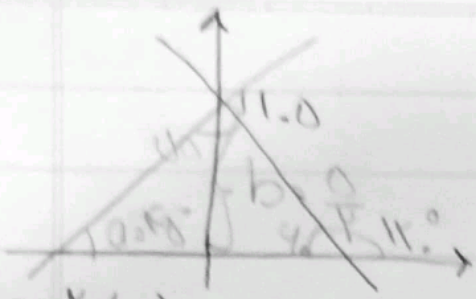


$m = \frac{\Delta y}{\Delta x} = \frac{۴ - ۲}{۳ + ۱} = \frac{۱}{۲}$

$m = \tan\theta = \frac{۱}{۲}$



$\cos\theta = \frac{۲}{\sqrt{۵}} = \frac{۲\sqrt{۵}}{۵}$



$2y = 2x + \theta$

$y = x + \frac{\theta}{2}$

$m = \tan\alpha = 1$

$\alpha = 45°$

$y = mx + b$ $m = \tan\frac{11\pi}{12} = -\sqrt{3}$

$mb = -\sqrt{3} \times \frac{\theta}{2} = -\frac{\theta\sqrt{3}}{2}$ (1

$f\left(\frac{\theta\pi}{4}\right) = \cos\left(\pi + \frac{\theta\pi}{4}\right) + \sin\left(\frac{\pi}{2} - \frac{\theta\pi}{4}\right) - \tan\left(\frac{11\pi}{2} + \frac{\theta\pi}{4}\right)$ (9

$= -\cos\left(\frac{\theta\pi}{4}\right) + \cos\left(\frac{\theta\pi}{4}\right) + \cot\left(\frac{\theta\pi}{4}\right)$

$= -\sqrt{3}$

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