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هلیا تولیاک

۱-

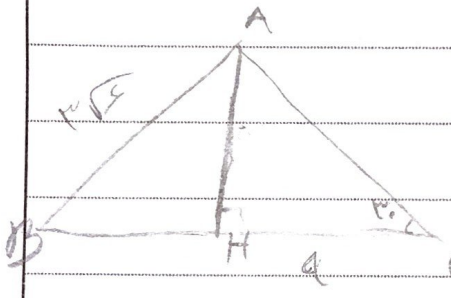
الف) $\left(\frac{\sqrt{2}}{2}\right)^2 - \left(\frac{\sqrt{3}}{2}\right)^2 = \left(\frac{\sqrt{2}}{2} - \frac{\sqrt{3}}{2}\right)\left(\frac{\sqrt{2}}{2} - \left(-\frac{\sqrt{3}}{2}\right)\right)$

$\frac{1}{2} - \frac{3}{4} = -\frac{1}{4}$

ب)

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

۲-



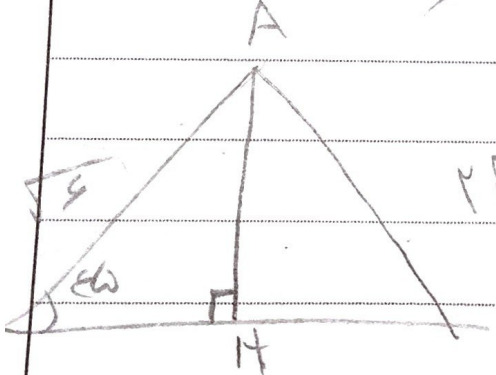
ب)

$$\frac{AH}{9} = \frac{1}{\sqrt{3}}$$

$$AH = \frac{9}{\sqrt{3}}$$

$$\sin B = \frac{\frac{9}{\sqrt{3}}}{3\sqrt{2}} = \frac{3}{\sqrt{18}} = \frac{3}{3\sqrt{2}} = \frac{\sqrt{2}}{2} \Rightarrow B = 45^\circ$$

ج)



الف)

$$\sin 45^\circ = \frac{\sqrt{2}}{2} = \frac{AH}{\sqrt{4}} \Rightarrow AH = \frac{\sqrt{12}}{2}$$

$$(2\sqrt{3})^2 - \left(\frac{\sqrt{12}}{2}\right)^2 = HC^2$$

$$12 - 3 = 9 \Rightarrow HC^2$$

$$HC = \pm 3$$

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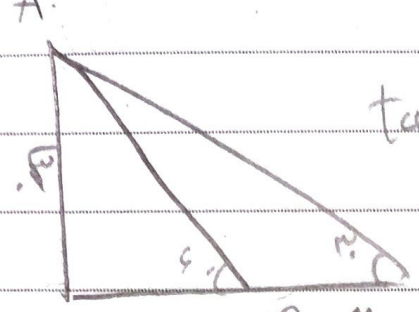
Arman

۳-

الف)



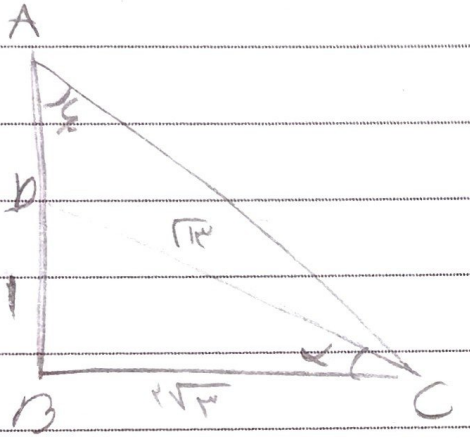
$$\tan 30^\circ = \frac{1}{\sqrt{3}} = \frac{50\sqrt{3}}{BC}$$

$$BC = 150$$

$$\tan 60^\circ = \sqrt{3} = \frac{50\sqrt{3}}{BC}$$

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

ب)



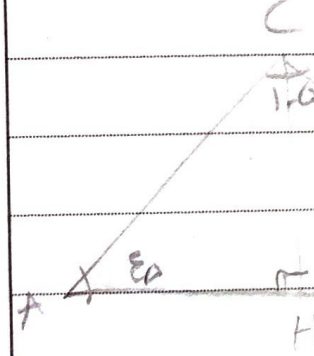
$$\frac{\sqrt{3}}{2} = \frac{BC}{4}$$

$$BC = 2\sqrt{3}$$

$$DC^2 = 1 + 12 = 13 \rightarrow DC = \sqrt{13}$$

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

۴-



$$45 + 105 = 150$$

$$180 - 150 = 30$$

$$\frac{AC}{\sin B} = \frac{CB}{\sin A} = \frac{AB}{\sin C}$$

$$\sin B = \frac{1}{2}, \quad \sin A = \sin 45 = \frac{\sqrt{2}}{2}, \quad \sin C = \sin 105$$

$$\frac{AC}{\frac{1}{2}} = \frac{BC}{\frac{\sqrt{2}}{2}} = \frac{AB}{\sin 105}$$

$$\frac{\sqrt{6}}{2} + \frac{\sqrt{2}}{2} = \frac{\sqrt{8}+\sqrt{2}}{2}$$

$$\frac{AB}{AC} = \frac{\sin 105}{\sin 30} = \sin 60\cos 45 + \sin 45\cos 60 =$$

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$$\frac{\frac{1}{2}\times 2\times 4\times \sin B_1}{\frac{1}{2}\times 2\times 4\times \sin B_2} = \frac{8}{18} = \frac{4}{9}$$ -۵

۶-

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

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

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

۷- $y=ax+b \quad a=\tan\alpha = \frac{\Delta y}{\Delta x} = \frac{4-2}{3-(-1)} = \frac{2}{4} = \frac{1}{2}$

$\cos^2\alpha$ / $\sqrt{5}$

$1+\tan^2\alpha = \frac{1}{\cos^2\alpha}$

$1+\frac{1}{4} = \frac{1}{\cos^2\alpha} \to \frac{5}{4} = \frac{1}{\cos^2\alpha}$

۸- $2y = 2x+5 \xrightarrow{\div 2} y = x+\frac{5}{2}$ $\Rightarrow m=1$

$\tan\theta = 1 \to \theta = 45$

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

$\frac{5}{2} = -\sqrt{3}(0)+b \to b = \frac{5}{2}$

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

$\frac{\sqrt{5}}{4}$ $\frac{5}{12}$

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$f(x) = -\cos x + \cos x + \cot x = \cot x$ -9

$\cot 150^\circ = -\sqrt{3}$

$\frac{\cos x - \sin x}{-\cos x + \sin x} = -1$ -10