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۲۰

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

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

۵

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

$3+$ ...

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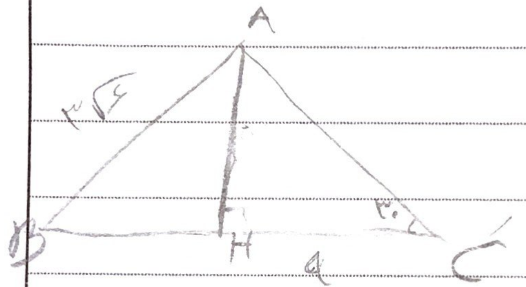
۲- الف)



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

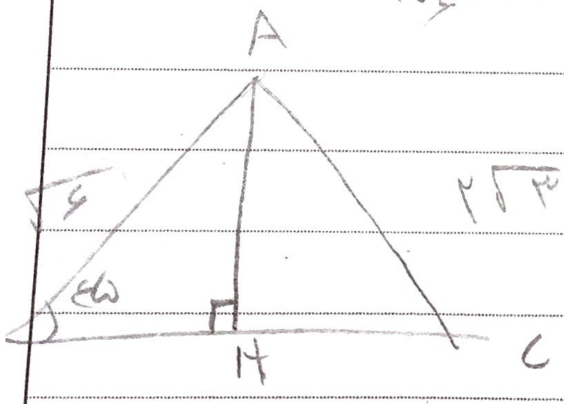
$AH=\frac{9}{\sqrt{3}}$

$\sin B=\frac{\frac{9}{\sqrt{3}}}{3\sqrt{6}}=\frac{3}{\sqrt{18}}=\frac{3}{3\sqrt{2}}=\frac{\sqrt{2}}{2}\Rightarrow$

$B=$ 45 یا 135

قبول

الف)



$2\sqrt{3}$

$\sin 45=\frac{\sqrt{2}}{2}=\frac{AH}{\sqrt{6}}\Rightarrow AH=\frac{\sqrt{12}}{2}$

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

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

$HC=3$

قبول

Arman

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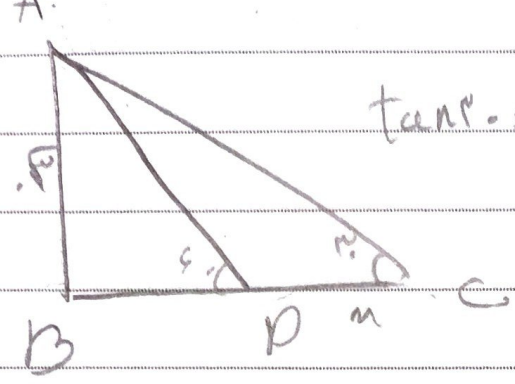
۳- الف)



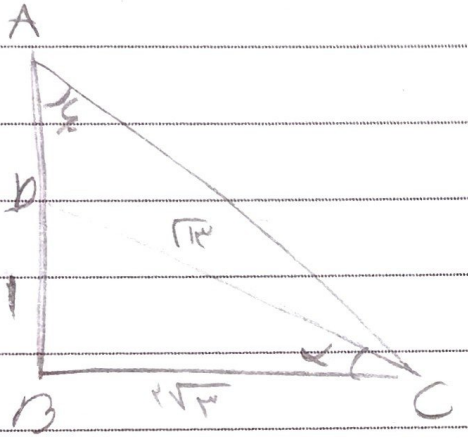
$$\tan 30^\circ = \frac{1}{\sqrt{3}} = \frac{90\sqrt{3}}{BC}$$

$$BC = 180$$

$$\tan 60^\circ = \sqrt{3} = \frac{90\sqrt{3}}{BC}$$

$$BC = 90 \Rightarrow x = 180 - 90 = 90$$

ب)



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

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

$$DC^2 = 4 + 12 = 16 \Rightarrow DC = \sqrt{16}$$

$$\sin\alpha = \frac{1}{\sqrt{16}}$$

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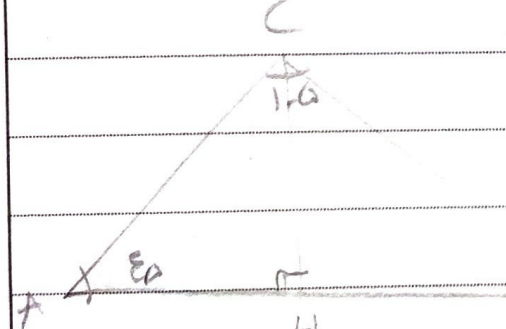

$$45 + 105 + C = 180$$

$$180 - 150 = 30$$

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

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

$$\frac{\sqrt{6}+\sqrt{2}}{4} \cdot \frac{\sqrt{2}}{2} = \frac{\sqrt{12}+2}{4}$$

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

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$$\frac{\frac{1}{2}\times 2\times 4\times \sin B_1}{\frac{1}{2}\times 3\times 6\times \sin B_2} = \frac{8}{18} = \frac{4}{9}$$

۶-

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

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

۷-

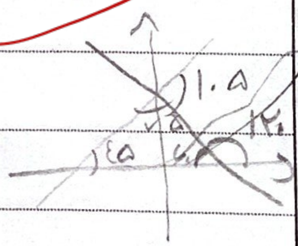
$y = ax + b \qquad a = \tan\alpha = \frac{\Delta y}{\Delta x}$ $\boxed{\cos = \frac{2}{\sqrt{5}}}$

$\frac{4-2}{3-(-1)} = \frac{2}{4} = \frac{1}{2} \rightarrow \alpha \qquad 1+\tan^2 = \frac{1}{\cos^2}$

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

۸-

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



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

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

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

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

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$f(x) = -\cos x + \cos x + \cot x = \cot x$ ۹

$\cot 150^\circ = -\sqrt{3}$ ۸

$\frac{\cos x - \sin x}{-\cos x + \sin x} = -1$ ۱۰