Date: ....

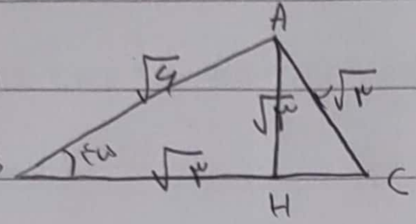
(هم‌رفتن) - ۲۰ ‏ ‏ ۲۰ ‏ ‏ آیسا علیاری

الف) $(\sin 135 + \sin 300)(\cos 315 - \cos 150)$ ①

$(\frac{\sqrt{2}}{2} - \frac{\sqrt{3}}{2})(\frac{\sqrt{2}}{2} + \frac{\sqrt{3}}{2}) \rightarrow \frac{2}{4} - \frac{3}{4} = \boxed{-\frac{1}{4}}$ ‏ ۵

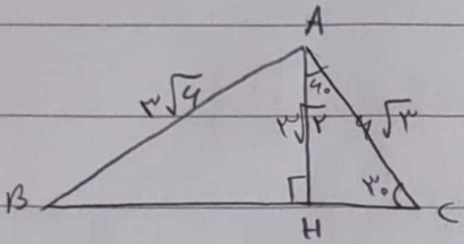
ب) $\frac{1 + 3\tan^2 210}{4\cos^2 330 + 2\cos^2 225} = \frac{1+1}{3+1} = \frac{2}{4} = \boxed{\frac{1}{2}}$

الف)



$12 - 3 = HC^2 \rightarrow HC = 3$ ‏ ۵ ②

ب)

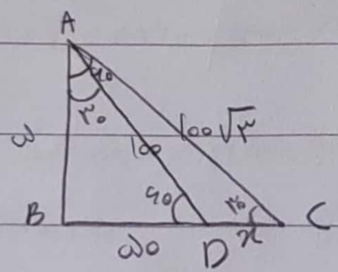


$AC = \sin 60 = \frac{\sqrt{3}}{2} = \frac{9}{\text{وتر}} \rightarrow \text{وتر} = 6\sqrt{3}$

$AH = (6\sqrt{3})^2 - (9)^2 = \sqrt{27} = 3\sqrt{3}$

$\sin B = \frac{3\sqrt{3}}{3\sqrt{6}} = \frac{1}{\sqrt{2}} = \boxed{\frac{\sqrt{2}}{2}} \Rightarrow B = 45^\circ$

الف)



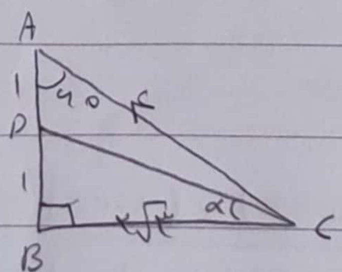
$AC = 2 \times 50\sqrt{3} = 100\sqrt{3}$ ‏ ۵ ③

$\sin 60 = \frac{50\sqrt{3}}{\text{وتر}} = \frac{\sqrt{3}}{2} \longrightarrow \text{وتر} = \frac{100\sqrt{3}}{\sqrt{3}} = 100$

$BD = \frac{100}{2} = 50$ ‏ $\sin 60 = \frac{\sqrt{3}}{2} = \frac{\text{مقابل}}{100\sqrt{3}} \rightarrow 150 = \text{مقابل}$

$150 - 50 = 100$

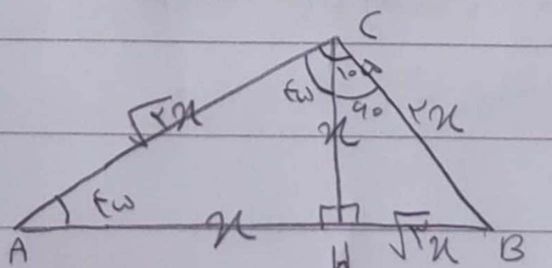
ب)



$AC = 2 \times 2 = 4$ ‏ $\sin 60 = \frac{\sqrt{3}}{2} = \frac{\text{مقابل}}{4} \rightarrow \text{مقابل} = 2\sqrt{3}$

$DC^2 = 1^2 + (2\sqrt{3})^2 \rightarrow \boxed{DC = \sqrt{13}}$

۵ ④



$4x^2 - x^2 = 3x^2 \Rightarrow BH = \sqrt{3}x$

$\cos 45 = \frac{\sqrt{2}}{2} = \frac{x}{AC} \Rightarrow AC = \sqrt{2}x$

$\frac{\sqrt{3}x + x}{\sqrt{2}x} = \frac{x(\sqrt{3}+1)}{\sqrt{2}x} = \boxed{\frac{\sqrt{3}+1}{\sqrt{2}}}$

Sibo

Date: .....

$S_{ABC} = \frac{1}{2} \times 2 \times 4 \times \sin\alpha = 4\sin\alpha$

$S_{BCD} = \frac{1}{2} \times 4 \times 3 \times \sin\alpha = 9\sin\alpha$

$\frac{4\sin\alpha}{9\sin\alpha} = \boxed{\frac{4}{9}}$

الف) $7 \times (\frac{1}{2} \times 3 \times 4 \times \sin 120) = 14 \times \frac{\sqrt{3}}{2} = \boxed{7\sqrt{3}}$

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

شیب $= a = \frac{\Delta y}{\Delta x} = \frac{4-2}{3-(-1)} = \frac{1}{2} = \tan\alpha = \frac{1}{2}$

$1 + \tan^2\alpha = \frac{1}{\cos^2\alpha} \rightarrow 1 + \frac{1}{4} = \frac{1}{\cos^2\alpha} \Rightarrow \cos\alpha = \frac{2}{\sqrt{5}} = \boxed{\frac{2\sqrt{5}}{5}}$

$2y = 2x + 3 \rightarrow y = x + 1/5 \Rightarrow a = \tan\alpha = 1 \Rightarrow \alpha = 45^\circ$

$y = mx + b \rightarrow m = a = \tan 120 = -\sqrt{3} \rightarrow y = x + 1/5 \longrightarrow 0 + 1/5 = y \Rightarrow y = 1/5$

$mb = -\sqrt{3} \times \frac{5}{2} = \boxed{-\frac{5\sqrt{3}}{2}}$

$f(x) = \cos(\pi + x) + \sin(\frac{\pi}{2} - x) - \tan(\frac{3\pi}{2} + x)$

$f(x) = -\cos x + \cos x - (-\cot x) = \cot x \Rightarrow f(\frac{5\pi}{4}) = \cot\frac{5\pi}{4} = \boxed{-\sqrt{3}}$

$$\frac{\sin(\frac{17\pi}{2} + x) + \cos(\frac{15\pi}{2} - x)}{\cos(3\pi + x) - \sin(4\pi - x)} =$$

$$\frac{(\sin 9\pi - \frac{\pi}{2} + x) + \cos(8\pi - \frac{\pi}{2} - x)}{\cos(2\pi + x) - \sin(4\pi - x)} = \frac{(-\cos x) + (\sin x)}{(-\cos x) - (-\sin x)} = \boxed{1}$$