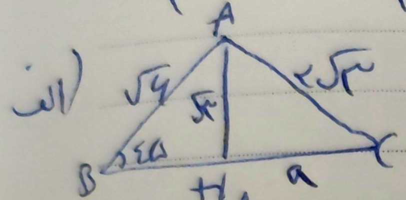
[illegible] - A۰۵ - ۲۰

۱۹

۱) الف) $\left(\frac{\sqrt2}{2}+\left(-\frac{\sqrt3}{2}\right)\right)\left(\frac{\sqrt2}{2}-\left(-\frac{\sqrt3}{2}\right)\right)=\left(\frac{\sqrt2-\sqrt3}{2}\right)\left(\frac{\sqrt2+\sqrt3}{2}\right)=\frac{2-3}{4}=-\frac14$

ب) $\frac{1+3\left(\frac{1}{\sqrt3}\right)^2}{4\times\frac34+2\times\left(-\frac{\sqrt2}{2}\right)^2}=\frac{2}{4}=\frac12$

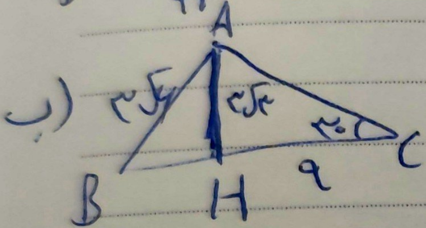
۲



۲) الف) $\sin 45°=\frac{\sqrt2}{2}=\frac{x}{\sqrt6}\to\frac{\sqrt{12}}{2}=\sqrt3$

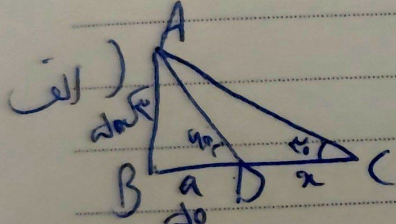
$(2\sqrt3)^2-(\sqrt3)^2=9\to a=3=\sqrt9$

۲



ب) $\tan 30°=\frac{1}{\sqrt3}=\frac{x}{9}\to\sqrt{27}=3\sqrt3$

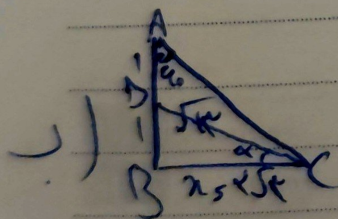
$\sin\alpha=\frac{3\sqrt3}{3\sqrt6}=\sqrt{\frac12}=\frac{\sqrt2}{2}\to\alpha=45°$



۳) الف) $\tan 60=\sqrt3=\frac{50\sqrt3}{a}\to 50$

$\tan 30=\frac{50\sqrt3}{50+x}=\frac{1}{\sqrt3}\to 150=50+x\to x=100$

۲

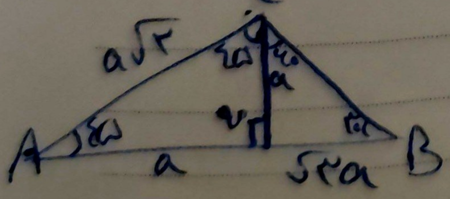


ب) $\tan 60°=\sqrt3=\frac{x}{2}\to 2\sqrt3$

$DC=\sqrt{1^2+(2\sqrt3)^2}=\sqrt{13}$

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

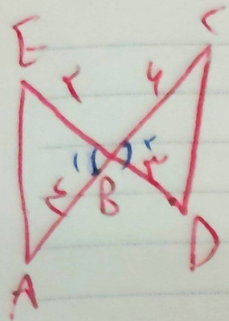
۲



۴) $a^2+a^2=2a^2\to AC=a\sqrt2$

$\tan 30=\frac{1}{\sqrt3}=\frac{a}{x}\to\sqrt3 a$

$\frac{AB}{AC}=\frac{\sqrt3a+a}{a\sqrt2}=\frac{a(\sqrt3+1)}{a\sqrt2}=\frac{\sqrt3+1\times\sqrt2}{\sqrt2\times\sqrt2}=\frac{\sqrt6+\sqrt2}{2}$



$\hat{B}_1 = \hat{B}_2$ متقابل به رأس

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

$\frac{S_{ABE}}{S_{BCD}} = \frac{\frac{1}{2} \times 2 \times 4 \times \sin B_1}{\frac{1}{2} \times 3 \times 4 \times \sin B_2} = \frac{2}{3}$

۵-

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

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

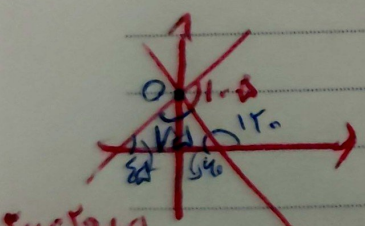
۶-

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

۷-

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

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



۸-

$O = [y]$

$y = 0 + 2/5 = 2/5$

$\rightarrow 2/5 = -\sqrt{3} \times 0 + b$

$b = 2/5$

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

۹-

$f(\frac{5\pi}{4}) = \cos(\frac{5\pi}{4} + \pi) + \sin(\frac{\pi}{2} - \frac{5\pi}{4}) - \tan(\frac{3\pi}{2} + \frac{5\pi}{4})$

$-\cos x + \cos x + \cot x = \cot x \rightarrow x = \frac{5\pi}{4} = -\sqrt{3}$

۱۰-

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