زهرا دهقانی ۱۸/۵ دهم دختران A تکلیف شماره ۲۰

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

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

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

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

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

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

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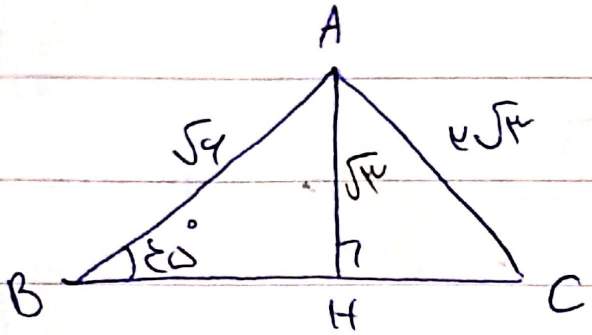
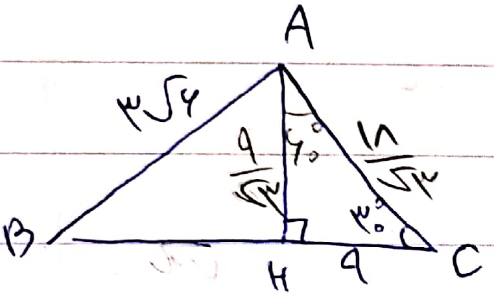


$$\sin 45^\circ = \frac{AH}{\sqrt{6}} = \frac{\sqrt{2}}{2}$$

$$AH = \sqrt{3}$$

$$(2\sqrt{3})^2 = (\sqrt{3})^2 + (HC)^2 \rightarrow 12 - 3 = (HC)^2$$

$$(HC)^2 = 9 \rightarrow \boxed{HC = 3}$$



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

$$AC = \frac{18}{\sqrt{3}}$$

$$\cos 60^\circ = \frac{AH}{\frac{18}{\sqrt{3}}} = \frac{1}{2} \rightarrow \frac{\frac{AH}{1}}{\frac{18}{\sqrt{3}}} = \frac{\sqrt{3}AH}{18} = \frac{1}{2}$$

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

$$\sin \hat{B} = \frac{\frac{9}{\sqrt{3}}}{\frac{3\sqrt{6}}{1}} = \frac{1}{\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}} = \frac{\sqrt{2}}{2} \rightarrow 45^\circ, 135^\circ$$

ولی جواب ۴۵° می‌شود چون منطقی‌تر است

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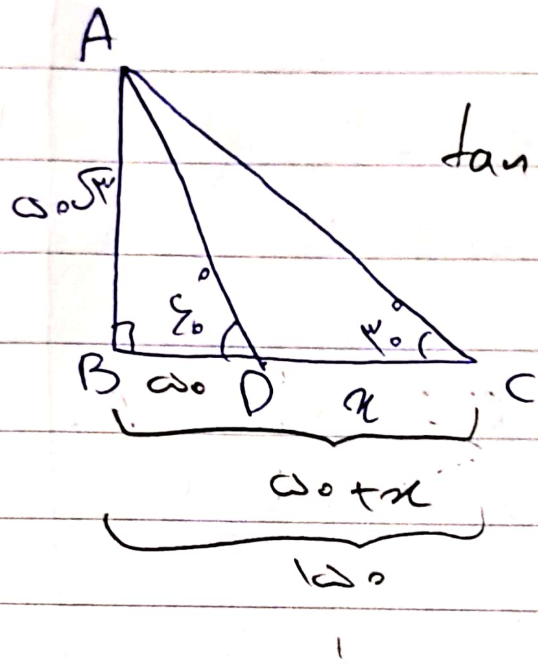


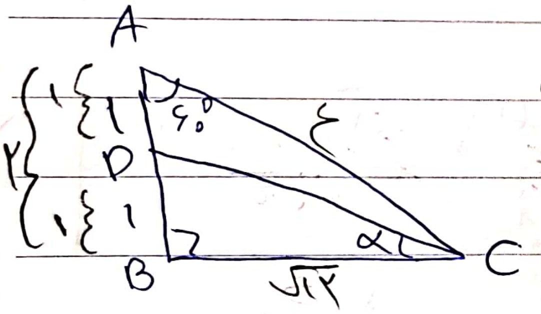
$$\tan 60^\circ = \frac{50\sqrt{3}}{BD} = \sqrt{3} \rightarrow BD = 50$$ ۳

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

$$\rightarrow 50\sqrt{3}(\sqrt{3}) = 50 + x$$ ۲

$$150 = 50 + x$$

$$\boxed{x = 100}$$



$$\cos 60^\circ = \frac{2}{AC} = \frac{1}{2} \rightarrow AC = 4$$

$$(BC)^2 = 16 - 4 \Rightarrow BC = \sqrt{12}$$

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

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

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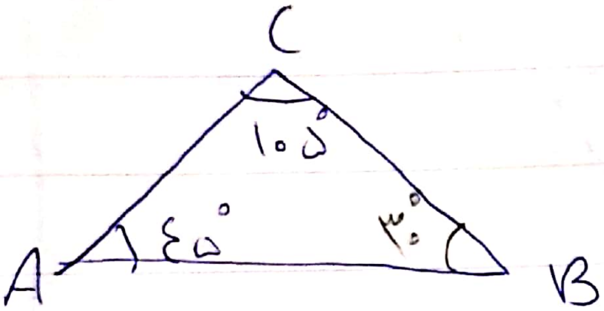

$$\frac{AB}{\cancel{\sin C}} = \frac{AC}{\cancel{\sin B}} = \frac{BC}{\cancel{\sin A}} \Rightarrow \frac{AB}{\sin 105^\circ} = \frac{AC}{\frac{1}{2}} = \frac{BC}{\frac{\sqrt{2}}{2}}$$

۱۰۵° ۳۰° ۴۵°

$$\rightarrow \frac{AB}{AC} \Rightarrow \frac{\frac{\sqrt{6}}{4} + \frac{\sqrt{2}}{4}}{\frac{1}{2}} = \boxed{\frac{\sqrt{2}+\sqrt{6}}{2}}$$

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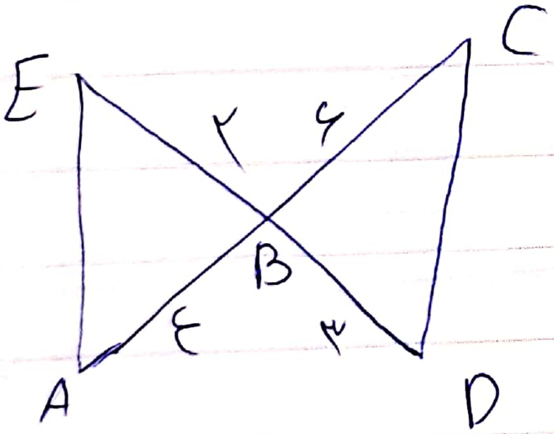

$$\frac{S_{A\hat{B}E}}{S_{D\hat{B}C}} = \frac{\cancel{\frac{1}{2}} \times 2 \times 4 \times \cancel{\sin\alpha}}{\cancel{\frac{1}{2}} \times 6 \times 3 \times \cancel{\sin\alpha}}$$

$$\Rightarrow \boxed{\frac{2 \times 4}{6 \times 3} = \frac{8}{18} = \frac{4}{9}}$$

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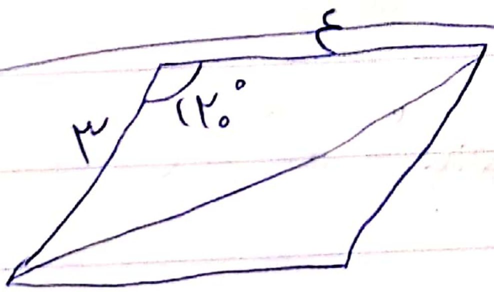
الف)



$$S = ab\sin\alpha$$

$$\Rightarrow 4 \times 3 \times \sin 120^\circ$$

$$\Rightarrow \cancel{12}^{\,6} \times \frac{\sqrt{3}}{\cancel{2}} = \boxed{6\sqrt{3}}$$

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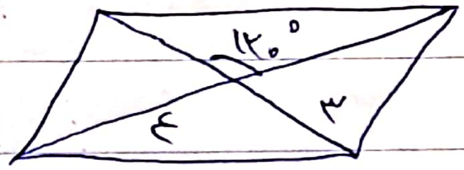
ب)



$$S = \frac{1}{2} \times d \times d' \times \sin\alpha$$

$$\Rightarrow \frac{1}{\cancel{2}} \times \cancel{4}^{\,2} \times 3 \times \frac{\sqrt{3}}{2}$$

$$\Rightarrow \cancel{2} \times 3 \times \frac{\sqrt{3}}{\cancel{2}} = \boxed{3\sqrt{3}}$$

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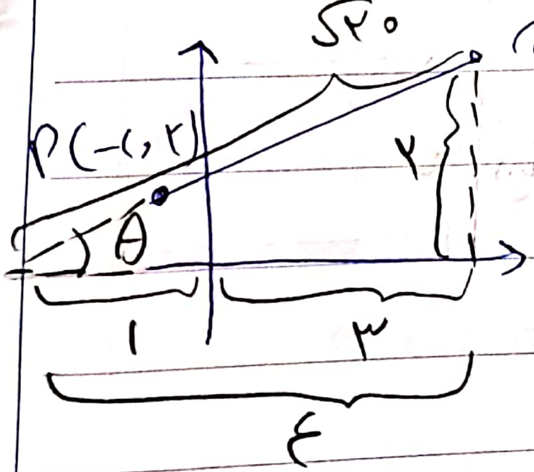

$$2^2 + 4^2 = (AB)^2 \rightarrow AB = \sqrt{20}$$

فیثاغورس $\Leftarrow 2^2 + 4^2 = (AB)^2$

$$AB = \sqrt{20}$$

$$\boxed{\cos\theta = \frac{\text{مجاور}}{\text{وتر}} = \frac{4}{\sqrt{20}}}$$

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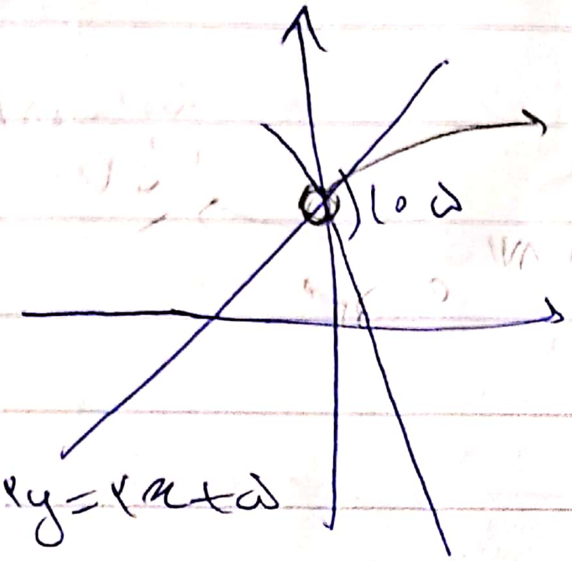

$2y = 2x + 5$

$y = mx + b$

در این نقطه هر دو
عرض از مبدا = ۰
پس می‌توانیم
که
بنویسیم

$x + \frac{5}{2} = mx + b = 0$

$$\frac{2y}{2} = \frac{2x + 5}{2}$$

$$y = \frac{2x}{2} + \frac{5}{2}$$

$$y = x + \frac{5}{2}$$

$\boxed{b = \frac{5}{2}}$

$mx = x \to \boxed{m = 1}$

$$mb = 1 \times \frac{5}{2} = \boxed{\frac{5}{2}}$$

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$-\tan(\frac{3\pi}{2}+x)$

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

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

$= \cancel{-\cos x} + \cancel{\cos x} + \cot x$

$= \cot x$

$f(\frac{3\pi}{4}) = \cot\frac{3\pi}{4} \to 135 \to \sqrt{2}$

$+\cos x$ $\quad$ $+\sin x$

$$\frac{\sin(\frac{\pi}{2}+x)+\cos(\frac{15\pi}{2}-x)}{\cos(2\pi+x)-\sin(7\pi-x)}$$ ۱۰

$+\cos x$ $\quad$ $-(+\sin x)$

$$\Rightarrow \cancel{\frac{+\cos x+\sin x}{+\cos x-\sin x}}$$