۱۹,۷۵ آفرین (☺) ★

باران مسلولی دهم ریاضی B

۱)

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

$= \left(\frac{\sqrt2}{2} - \frac{\sqrt3}{2}\right)\left(\frac{\sqrt2}{2} + \frac{\sqrt3}{2}\right) \xrightarrow{\text{مزدوج}} \frac{2}{4} - \frac{3}{4} = -\frac{1}{4}$

ب) $\frac{1+3\tan^2 210°}{4\cos^2 330° + 2\cos^2 225°} = \frac{1+3\left(\frac{1}{\sqrt3}\right)^2}{4\times\frac{3}{4} + 2\left(-\frac{\sqrt2}{2}\right)^2} = \frac{1+1}{3+1} = \frac{1}{2}$

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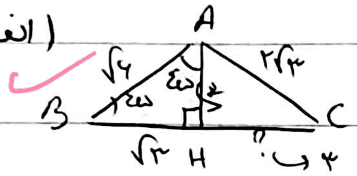
۲)

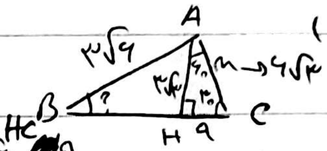
الف)



$\sin 45° = \frac{\sqrt2}{2} = \frac{AH}{AB} = \frac{AH}{\sqrt6} \Rightarrow AH = \frac{\sqrt{12}}{2}$

فیثاغورث $\Rightarrow HC^2 = (2\sqrt3)^2 - (\sqrt3)^2 = 12 - 3 = 9 \rightarrow HC = \sqrt9 = 3$

ب)



$\cos 30° = \frac{\sqrt3}{2} = \frac{9}{AC} \Rightarrow AC = 6\sqrt3$

$\sin 30° = \frac{1}{2} = \frac{AH}{AC} = \frac{AH}{6\sqrt3} \Rightarrow AH = 3\sqrt3$

$\sin \hat{B} = \frac{AH}{AB} = \frac{3\sqrt3}{3\sqrt6} = \frac{1}{\sqrt2} \rightarrow B = 45°$ ✓ ، $135°$ ✗

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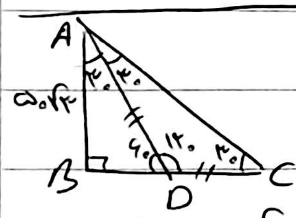
۳)

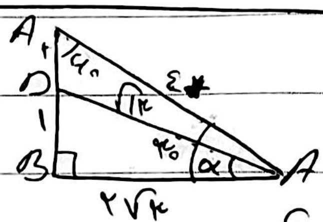
الف)



$\sin 60 = \frac{\sqrt3}{2} = \frac{AB}{AD} = \frac{50\sqrt3}{AD} \Rightarrow AD = 100$

$AD = DC \longrightarrow DC = 100$

ب)



$\sin 60° = \frac{BC}{AC} = \frac{\sqrt3}{2} \rightarrow BC = 2\sqrt3$ ، $AC = 4$

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

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

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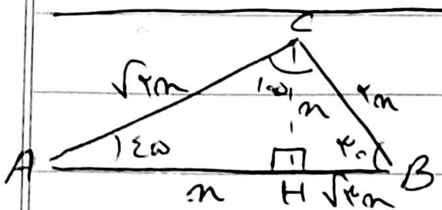
۴)



$\sin 30 = \frac{1}{2} = \frac{CH}{CB}$ ، $\cos 30° = \frac{\sqrt3}{2} = \frac{HB}{CB}$

$\sin 45 = \frac{\sqrt2}{2} = \frac{1}{\sqrt2} = \frac{CH}{CA}$ ، $\cos 45° = \frac{\sqrt2}{2} = \frac{1}{\sqrt2} = \frac{AH}{CA}$

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

SiDO

(٣)

$$SABE = \frac{\frac{1}{2}\times\sin\alpha\times 2\times 4}{\frac{1}{2}\times\sin\alpha\times 4\times 2} = \frac{8}{16} = \frac{4}{8}$$

(٤)

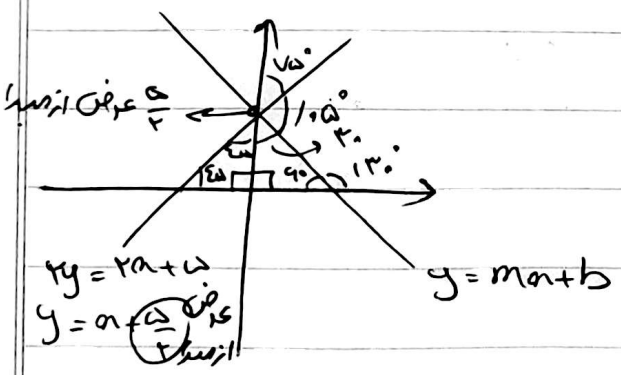
$$\text{المثلث} = \frac{1}{2}\times 2\times 4\times\sin 120^\circ = 4\sqrt{3}$$

$$\text{نصف دائرة} = \frac{1}{2}\times\pi\times 2\times 2 = 2\pi$$

(٧)

$$y = ax+b \rightarrow y = \frac{1}{2}x+b \qquad \tan\theta = \frac{1}{2}$$

$$\text{ميل} = \frac{y_2-y_1}{x_2-x_1} = \frac{2}{4} = \frac{1}{2} \qquad 1+\tan^2\theta = \frac{1}{\cos^2\theta} \rightarrow \cos\theta$$



(٨)

$$\tan 120^\circ = \frac{\sqrt{3}}{-\frac{1}{2}} = -\sqrt{3}$$

$$y = -\sqrt{3}x+b \rightarrow \frac{a}{2}$$

$$\text{يمر بـ} \rightarrow \frac{a}{2} = -\sqrt{3}(0)+b \rightarrow \frac{a}{2}$$

$$m = -\sqrt{3} \quad b = \frac{a}{2} \rightarrow mb = \frac{-a\sqrt{3}}{2}$$

$$\frac{a\pi}{2} = 150^\circ - m$$

(٩)

$$\cos\left(\frac{\pi}{2}+150^\circ\right)+\sin\left(\frac{\pi}{2}-150^\circ\right)$$

$$-\tan\left(\frac{3\pi}{2}+150^\circ\right) = +\cot(150^\circ)$$

$$\rightarrow \cos(150^\circ)-\cos(150^\circ)-\cot(150^\circ)$$

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

$$\cot 150^\circ = \frac{-\sqrt{3}}{\frac{1}{2}} = -\sqrt{3}$$

$$\frac{\sin\left(\frac{17\pi}{2}+\alpha\right)+\cos\left(\frac{13\pi}{4}-\alpha\right)}{\cos(2\pi+\alpha)-\sin(4\pi-\alpha)} = \frac{\cos(\alpha)-\sin(\alpha)}{-\cos(\alpha)+\sin(\alpha)} \quad (10)$$

$$= \frac{\cos(\alpha)-\sin(\alpha)}{-(\cos(\alpha)-\sin(\alpha))} = -1 \quad (2)$$

4

$$\underbrace{(\pi+\alpha)}_{-\cos\alpha} + \underbrace{\sin\left(\frac{\pi}{2}-\alpha\right)}_{\cos\alpha} - \tan\left(\frac{3\pi}{2}+\alpha\right)$$

$$-\cos\alpha + \cos\alpha + \cot\alpha$$

$$\varphi(\alpha) = \cot\alpha \longrightarrow \varphi\left(\frac{3\pi}{4}\right) = \cot\left(\frac{3\pi}{4}\right) = -\sqrt{1}$$