۲۵

درس ریاضی — تکلیف شماره ۲۰ — دهم دختر

سوال ۱) الف) $\cos 150° = -\frac{\sqrt{3}}{2}$, $\cos 315 = \frac{\sqrt{2}}{2}$, $\sin 300° = -\frac{\sqrt{3}}{2}$, $\sin 135° = \frac{\sqrt{2}}{2}$

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

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

سوال ۲) الف) $AH = \sin 45 \times AB = \frac{\sqrt{2}}{2}\times\sqrt{6} = \frac{\sqrt{12}}{2}$

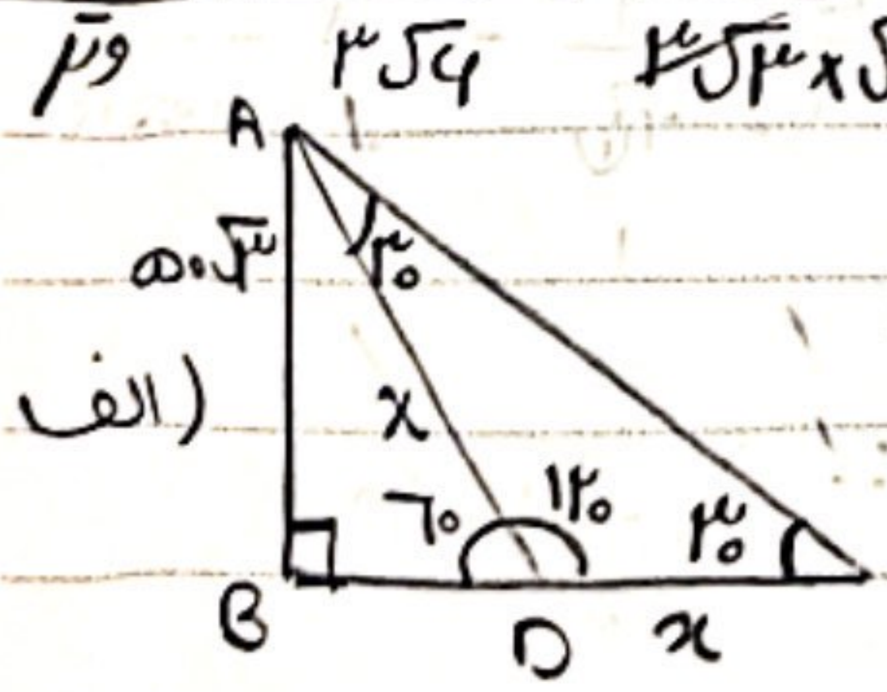
$HC^2 = (2\sqrt{3})^2 - \left(\frac{\sqrt{12}}{2}\right)^2 = 12 - 3 = 9 \xrightarrow{\sqrt{}} HC = 3$

ب) $\frac{\sqrt{3}}{2}AC = 9 \Rightarrow AC = 9\times\frac{2}{\sqrt{3}} = 9\times\frac{2\sqrt{3}}{3} = 6\sqrt{3}$

$\Rightarrow AH =$ ضلع روبه رو به زاویه $30°$ $= 6\sqrt{3}\times\frac{1}{2} = 3\sqrt{3}$

$\sin = \frac{\text{مقابل}}{\text{وتر}} = \frac{3\sqrt{3}}{3\sqrt{6}} = \frac{\cancel{3\sqrt{3}}}{\cancel{3\sqrt{3}}\times\sqrt{2}} = \frac{\sqrt{2}}{2} \Rightarrow$ sin چه زاویه‌ای برابر $\frac{\sqrt{2}}{2}$ ؟ $\Rightarrow B = 45°$

سوال ۳) الف)



با توجه به شکل مثلث ADC متساوی الساقین است ←

$AD \times \sin 60° = AB$

$\Rightarrow AD = AB \div \sin 60° = 50\cancel{\sqrt{3}}\times\frac{2}{\cancel{\sqrt{3}}} = 100$

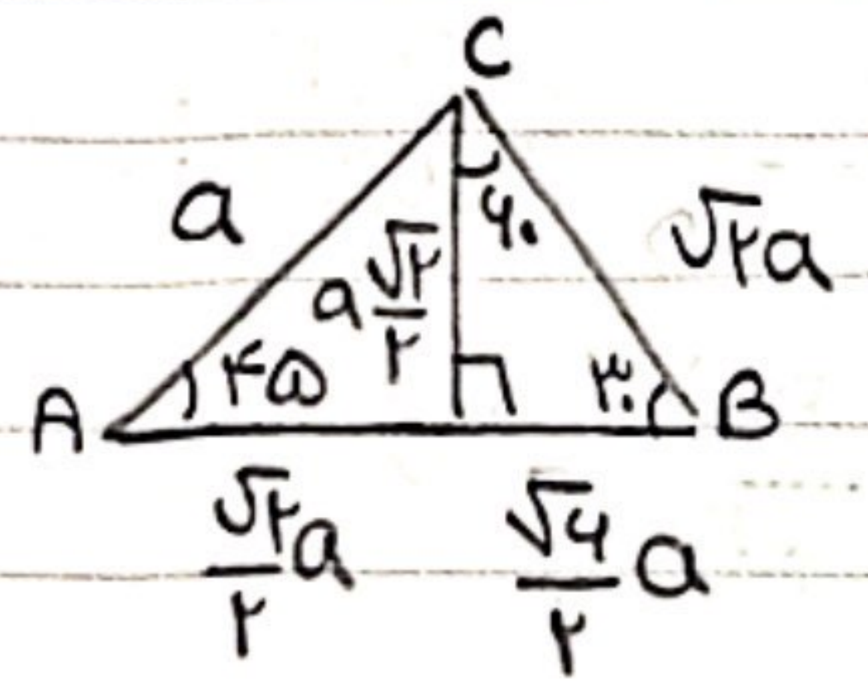
$x = 100$

ب) $\tan 60^\circ = \frac{BC}{AB} \rightarrow \frac{\sqrt{3}}{1} = \frac{\boxed{}}{2} \rightarrow BC = 2\sqrt{3}$

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

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

سوال ۴)



$\rightarrow \frac{AB}{AC} = \frac{a\left(\frac{\sqrt{2}+\sqrt{6}}{2}\right)}{a} = \frac{\sqrt{2}+\sqrt{6}}{2}$

سوال ۵)

$$\frac{S_{\hat{ABE}}}{S_{\hat{BCD}}} = \frac{\cancel{\frac{1}{2}} \times BE \times AB \times \cancel{\sin\alpha}}{\cancel{\frac{1}{2}} \times BC \times BD \times \cancel{\sin\alpha}} = \frac{2\times 4}{6\times 3} = \frac{4}{9}$$

α در ۲ مثلث مشترک اند

سوال ۶) الف) ابتدا مساحت یک مثلث را بدست آورده و سپس ×۲ می‌کنیم پس:

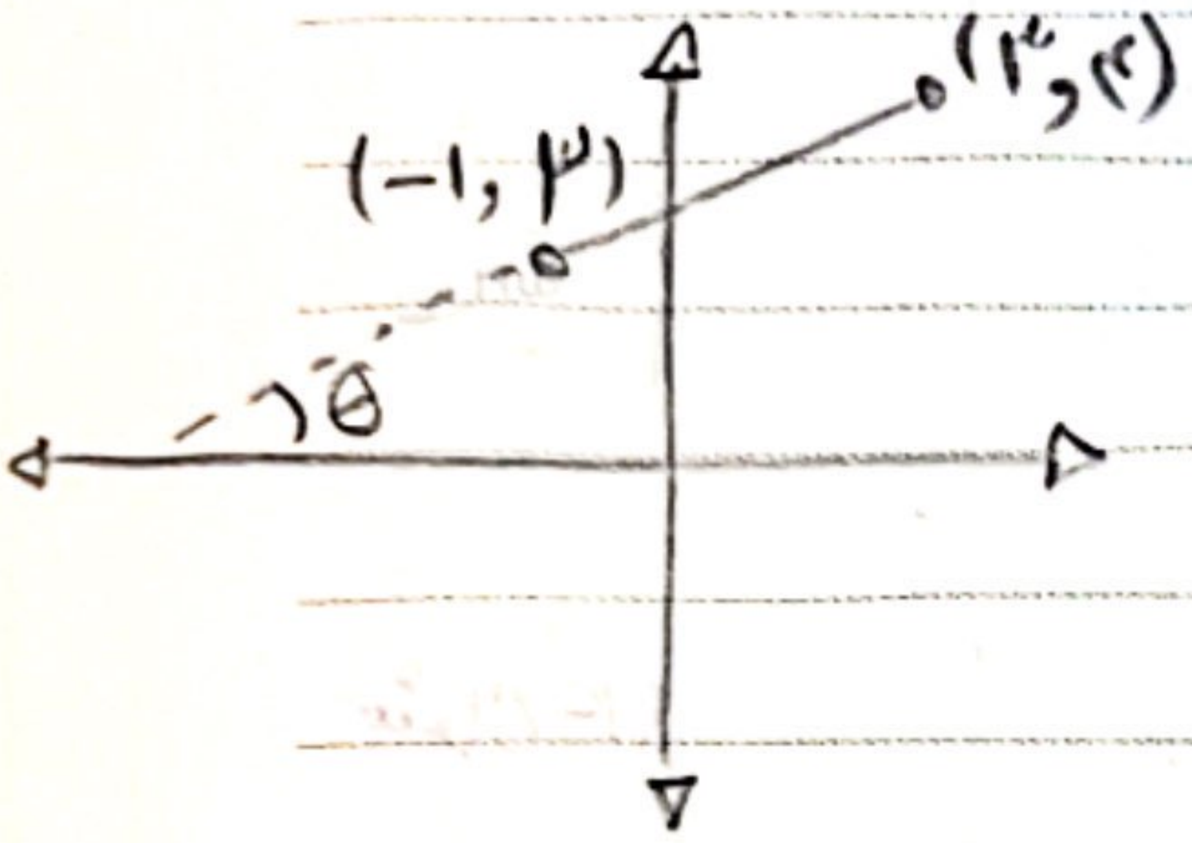
$S_{\text{متوازی‌الاضلاع}} = S_{\text{مثلث}} \times 2 = 2 \times \frac{1}{2} ab\sin\alpha = ab\sin\alpha$

$\rightarrow 3 \times 4 \times \sin 120^\circ = 12 \times \frac{\sqrt{3}}{2} = 6\sqrt{3}$

ادامه سؤال ۶)

ب) متوازی الاضلاع $= \frac{1}{2} ab \sin\alpha$

$$\frac{1}{2}\times 3\times 4\times \sin 120^\circ = 6\times\frac{\sqrt{3}}{2} = 3\sqrt{3}$$

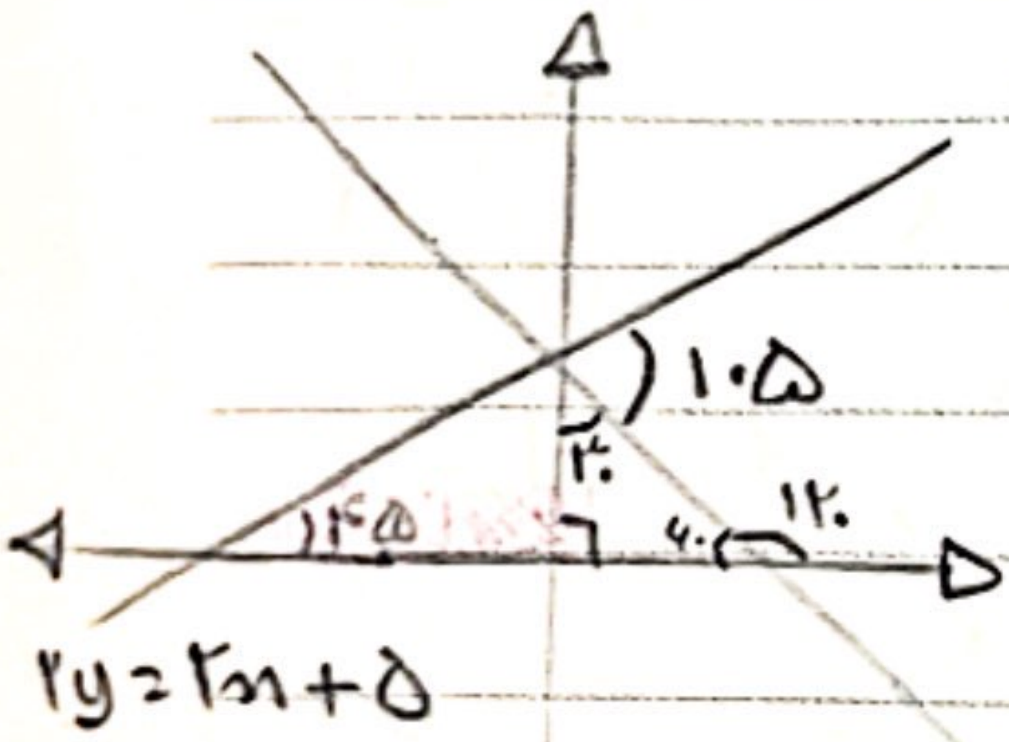


سؤال ۷)

$$\text{شیب} = \frac{\Delta y}{\Delta x} = \frac{4-2}{3+1} = \frac{1}{2}$$

$$\tan\theta = \frac{1}{2} \longrightarrow \tan^2\theta + 1 = \frac{1}{\cos^2\theta}$$

$$\frac{1}{4} + \frac{4}{4} = \frac{1}{\cos^2\theta} \longrightarrow \cos\theta = \frac{2\sqrt{5}}{5}$$



سؤال ۸)

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

$$\tan\theta = 1 \longrightarrow \theta = 45^\circ$$

$$y = mx+b \qquad \tan 120 = \sqrt{3} \longrightarrow m = -\sqrt{3},\ b = \frac{5}{2}$$

$$mb = \frac{5}{2}\times -\sqrt{3} = \frac{-5\sqrt{3}}{2} \longleftarrow y = -\sqrt{3}x + \frac{5}{2} \longleftarrow 1$$

سؤال ۱۹

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

$$= \cos\left(\frac{5\pi}{4}\right) - \cos\left(\frac{5\pi}{4}\right) - \cot\left(\frac{5\pi}{4}\right) = -\cot 150 = \sqrt{3}$$

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

سؤال ۲۰

$$\frac{\sin\left(\frac{11\pi}{2}+x\right) + \cos\left(\frac{15\pi}{2} - x\right)}{\cos(3\pi + x) - \sin(4\pi - x)} = \frac{\sin\left(\frac{\pi}{2}+x\right) + \cos\left(\frac{\pi}{2} - x\right)}{\cos(\pi + x) - \sin(\pi - x)}$$

روز سینما

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