

تکلیف شماره ۲

کلاس دهم ریاضی

۲۰

الف) $(\sin 15^\circ + \sin 30^\circ)(\cos 15^\circ - \cos 45^\circ) = \left(\frac{\sqrt{2}}{2} + (-\frac{\sqrt{2}}{2})\right) \left(\frac{\sqrt{2}}{2} + \frac{\sqrt{2}}{2}\right)$
 ب) $\frac{1 + 3 \tan^2 30^\circ}{\cos^2 30^\circ + \cos^2 45^\circ} = \frac{1 + 1}{\frac{3}{4} + 1} = \frac{2}{\frac{7}{4}} = \frac{8}{7}$
 $\frac{(\sqrt{2} - \sqrt{2})}{2} \times \frac{(\sqrt{2} + \sqrt{2})}{2} = \frac{-1}{2}$

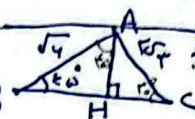
$AH = \sqrt{2}$ و $AC = 2\sqrt{2}$

$\frac{AH}{AC} = \frac{\sqrt{2}}{2\sqrt{2}} = \frac{1}{2}$

$\Rightarrow \sin 30^\circ = \frac{1}{2} \Rightarrow \hat{C} = 30^\circ$

$\tan 30^\circ = \frac{\sqrt{2}}{2} = \frac{AH}{HC} = \frac{\sqrt{2}}{HC} \Rightarrow \boxed{HC = 2}$

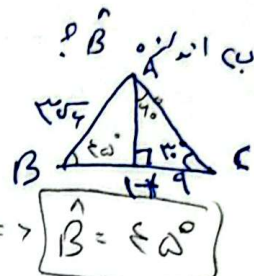
$\tan 45^\circ = 1 \Rightarrow AH = BH = x$
 $x^2 + x^2 = (\sqrt{2})^2 \Rightarrow x = 1$



$\tan 30^\circ = \frac{\sqrt{2}}{2} = \frac{AH}{9}$

$\Rightarrow AH = 3\sqrt{2}$

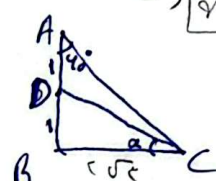
$\frac{AH}{AB} = \sin \hat{B} = \frac{3\sqrt{2}}{4\sqrt{2}} = \frac{3}{4} \Rightarrow \hat{B} = 45^\circ$



$\tan 45^\circ = 1 = \frac{AB}{BD} = \frac{AB}{BD \cdot \sqrt{2}} \Rightarrow BD = \frac{AB}{\sqrt{2}}$
 $\Rightarrow BD = 50$

$\tan 30^\circ = \frac{\sqrt{2}}{2} = \frac{AB}{BC} = \frac{50\sqrt{2}}{x + 50} \Rightarrow 100 = x + 50$

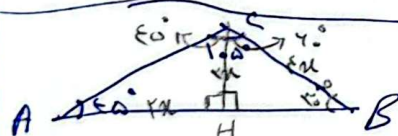
$\Rightarrow \boxed{x = 50}$



$\tan 45^\circ = 1 = \frac{BC}{AB} = \frac{BC}{2} \Rightarrow BC = 2\sqrt{2}$

$BD + BC = DC \Rightarrow DC = \sqrt{2}$

$\sin \alpha = \frac{BD}{DC} = \frac{1}{\sqrt{2}} = \frac{\sqrt{2}}{2}$



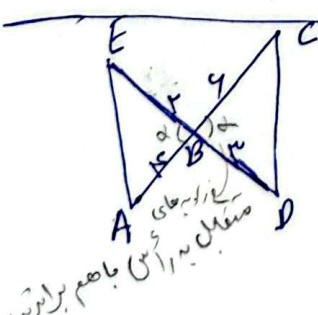
$\sin 30^\circ = \frac{1}{2} = \frac{CH}{CB} \Rightarrow CH = \frac{1}{2} CB$

$CB = 2x$

$\tan 45^\circ = 1 \Rightarrow CH = AH = x$
 $AC = 2\sqrt{2}x$

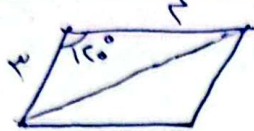
$AB \Rightarrow \tan 45^\circ = 1 = \frac{BH}{CH} = \frac{BH}{x} \Rightarrow BH = x$
 $AH + BH = (1 + \sqrt{2})x = AB$

$\frac{AB}{AC} = \frac{(1 + \sqrt{2})x}{2\sqrt{2}x} = \frac{1 + \sqrt{2}}{2\sqrt{2}} = \frac{\sqrt{2} + 2}{4}$

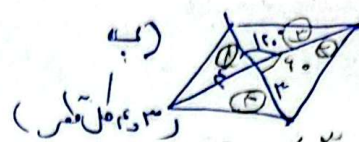


$\frac{S_{ABE}}{S_{BCD}} = \frac{AB \times BE \times \sin \alpha \times \frac{1}{2}}{BD \times BC \times \sin \alpha \times \frac{1}{2}} = \frac{AB \times BE}{BD \times BC} = \frac{4 \times 5}{3 \times 4} = \frac{5}{3}$

الف)



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



مساحت 4
 $\sin 40^\circ = \frac{\sqrt{3}}{2}$
 $\sin 120^\circ = \frac{\sqrt{3}}{2}$

$$= 4 \times \left(\frac{3}{4} \times \frac{4}{4} \times \frac{\sqrt{3}}{4} \times \frac{1}{4} \right) =$$

$$= 4 \times \frac{3\sqrt{3}}{4} = 3\sqrt{3}$$

$Q(3, 4)$

$P(-1, 2)$

$$a = \frac{\Delta y}{\Delta x} = \frac{2}{4} = \frac{1}{2}$$

که شیب خط است برابر با قائم‌الزاویه
 زاویه θ است

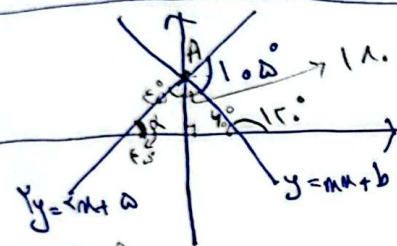
$\cos \theta = \frac{4}{5}$

که خط با محور مثبت محور x و محور y دارد.

$$\tan \theta = \frac{1}{2}$$

$$\sin^2 \theta + \cos^2 \theta = 1 \Rightarrow \tan^2 \theta + 1 = \frac{1}{\cos^2 \theta} \Rightarrow \cos^2 \theta = \frac{4}{5} \Rightarrow \cos \theta = \frac{2}{\sqrt{5}}$$

$$\Rightarrow \cos \theta = \frac{2\sqrt{5}}{5}$$



$$y = mx + b$$

$$m = \tan 120^\circ = -\sqrt{3}, A(0, 5)$$

$$\frac{b}{5} = -\sqrt{3} \times \frac{0}{1} + b \Rightarrow b = 5$$

$$mb = -\sqrt{3} \times 5 = -5\sqrt{3}$$

$\tan \theta = 1 \Rightarrow \theta = 45^\circ$
 $A(0, 5)$

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

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

$$f(x) = \cot x = \cot\left(\frac{5\pi}{4}\right) = -1$$

$$\frac{\sin\left(\frac{11\pi}{4} + x\right) + \cos\left(\frac{10\pi}{4} - x\right)}{\cos\left(\frac{9\pi}{4} + x\right) - \sin\left(\frac{7\pi}{4} - x\right)} = \frac{\sin\left(\frac{\pi}{4} + x\right) + \cos\left(\frac{\pi}{4} - x\right)}{\cos(\pi + x) - \sin(-x)}$$

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