نام و نام خانوادگی ..... پاسخنامه تشریحی تکلیف شماره ۳ ... کلاس .....

۱

الف) $(\sin 125^\circ + \sin 200^\circ)(\cos 315^\circ - \cos 15^\circ) = \left(\frac{\sqrt{2}}{2} + \left(-\frac{\sqrt{3}}{2}\right)\right)\left(\frac{\sqrt{2}}{2} - \left(-\frac{\sqrt{3}}{2}\right)\right)$

$\frac{\sqrt{2}-\sqrt{3}}{2} \times \frac{\sqrt{3}+\sqrt{3}}{2} = \frac{2-3}{4} = -\frac{1}{4}$

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

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

$= \frac{1+1}{3+1} = \frac{2}{4} = \frac{1}{2}$

۲

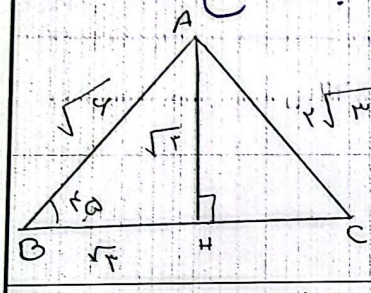
الف) HC طول ضلع؟

$AH = BH = \sqrt{2}$

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

$12 = 2 + HC^2$

$HC^2 = 9 \rightarrow HC = 3$



ب) اندازه زاویه B؟

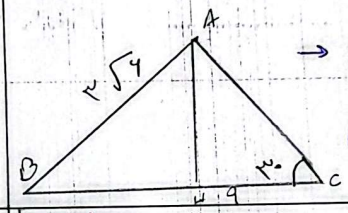
$\cos 30^\circ = \frac{\sqrt{3}}{2} = \frac{9}{AC} \rightarrow$

$AC = 9\sqrt{3}$

$\sin B = \frac{2\sqrt{4}}{2\sqrt{9}} = \frac{\sqrt{4}}{\sqrt{9}}$

$\rightarrow \frac{1}{\sqrt{2}} = \frac{\sqrt{2}}{2}$

$\hat{B} = 45^\circ$



الف) مقدار x؟

$\sin 30^\circ = \frac{1}{2} = \frac{5\sqrt{2}}{AC} \rightarrow AC = 10\sqrt{2}$

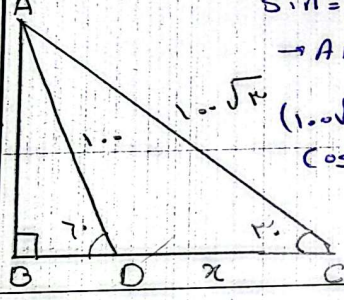
$\sin 45^\circ = \frac{\sqrt{2}}{2} = \frac{5\sqrt{2}}{AD}$

$\rightarrow AD = 10$

$(10\sqrt{2})^2 = (5\sqrt{2})^2 + (5+x)^2$

$\cos 30^\circ = \frac{\sqrt{3}}{2} = \frac{5+x}{10\sqrt{2}}$

$\rightarrow x = 10$



ب) $\sin\alpha$ = ?

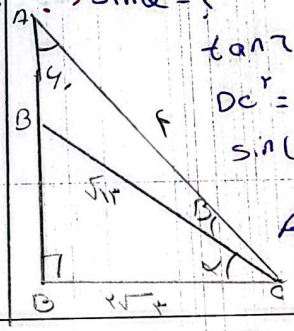
$\tan 30^\circ = \frac{\sqrt{3}}{3} = \frac{BC}{2} \rightarrow BC = 2\sqrt{3}$

$DC^2 = 1^2 + (2\sqrt{3})^2 = 13 \rightarrow DC = \sqrt{13}$

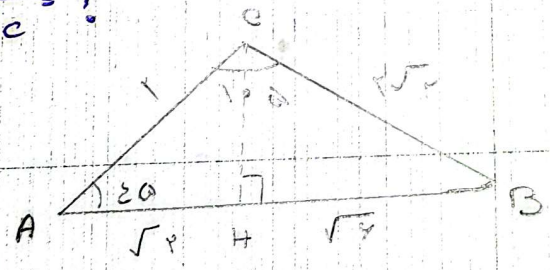
$\sin(\alpha+\beta) = \frac{1}{2} = \frac{AB}{AC}$

$AC = 4$

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



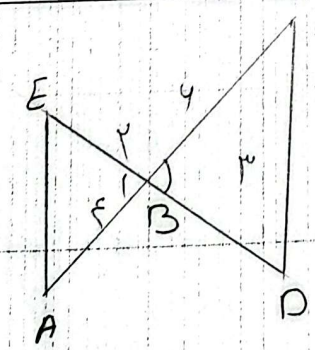
$\frac{AB}{AC} = ?$



$AB = \sqrt{2} + \sqrt{9}$

$AC = 2$

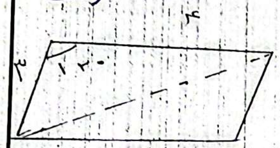
$\frac{AB}{AC} = \frac{\sqrt{2}+\sqrt{9}}{2}$



$\frac{S_{\triangle ABE}}{S_{\triangle BCD}} = \frac{\frac{1}{2}\times 2\times 4\times \sin\beta}{\frac{1}{2}\times 3\times 4\times \sin\beta} = \frac{4}{9}$

۶

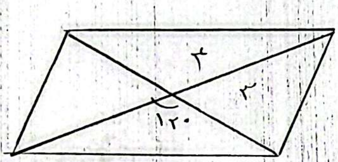
الف)



$S = ۲ \times \frac{1}{۲} \times ۳ \times ۴ \times \sin ۱۲۰ =$

$۲ \times \frac{1}{۲} \times ۳ \times ۴ \times \frac{\sqrt{۳}}{۲} = ۶\sqrt{۳}$

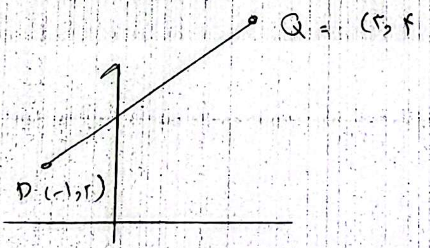
ب)



$S = \frac{1}{۲} ab\sin\alpha = \frac{1}{۲} \times ۴ \times ۶ \times \frac{\sqrt{۳}}{۲}$
$= ۳\sqrt{۱۲}$

۷

$\cos\theta = ?$

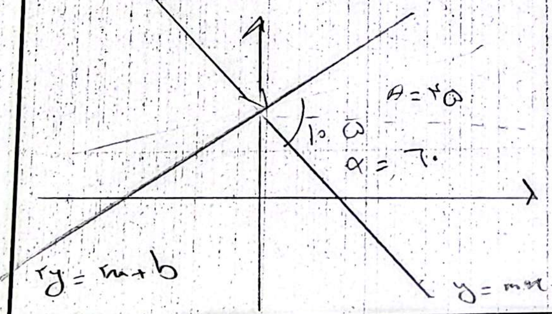


شیب خط $= \frac{y_۲ - y_۱}{x_۲ - x_۱} = \frac{۴ - ۲}{۳ - (-۱)} = \frac{۲}{۴} = \frac{1}{۲}$

$\tan A = \frac{1}{۲}$

$\cos A = \frac{1}{\sqrt{\tan^۲ + 1}} = \frac{1}{\sqrt{\frac{1}{۴} + 1}} = \frac{۲}{\sqrt{۵}}$

۸



$\beta + \alpha = ۱۰۵^\circ$

$۲y = ۲x + ۵ \rightarrow y = x + ۲/۵$

$\tan\theta = 1 \longrightarrow \beta = ۴۵^\circ$

$۱۰۵ - ۴۵ = ۶۰$

$\alpha = \beta \rightarrow \beta = ۶۰ \rightarrow \tan = ۶۰^\circ = \sqrt{۳}$

$y = mx + b \quad ۲/۵ = \sqrt{۳}(0) + b \Rightarrow b = ۲/۵ \quad mb = ۲/۵\sqrt{۳}$

۹

$f(x) = \cos(\pi + x) + \sin(\frac{\pi}{۲} - x) - \tan(\frac{۳\pi}{۲} + x)$

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

$f(\frac{۵\pi}{۶}) = ?$

$\Rightarrow f(۱۵۰) = \cot(۱۵۰) = -\sqrt{۳}$

۱۰

$\frac{\sin(\frac{۱۷\pi}{۲} + x) + \cos(\frac{۱۵\pi}{۲} - x)}{\cos(۴\pi - x) - \sin(۶\pi - x)} = \frac{\cos x + (-\sin x)}{-\cos x + \sin x}$

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