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

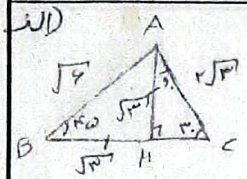
۱

الف) $(\sin 135^\circ + \sin 30^\circ)(\cos 30^\circ - \cos 150^\circ) = \left(\frac{\sqrt{2}}{2} - \frac{\sqrt{3}}{2}\right)\left(\frac{\sqrt{2}}{2} + \frac{\sqrt{3}}{2}\right) = \left(\frac{\sqrt{2}}{2}\right)^2 - \left(\frac{\sqrt{3}}{2}\right)^2 = \frac{2}{4} - \frac{3}{4} = -\frac{1}{4}$

ب) $\frac{1 + 3\tan^2 210^\circ}{2\cos^2 240^\circ + 2\cos^2 225^\circ} = \frac{1 + 3\left(\frac{\sqrt{3}}{3}\right)^2}{2\left(\frac{\sqrt{3}}{2}\right)^2 + 2\left(-\frac{\sqrt{2}}{2}\right)^2} = \frac{1+1}{3+1} = \frac{2}{4} = \frac{1}{2}$

۲

الف)

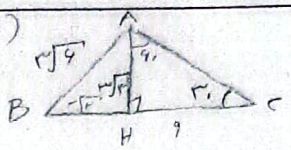


$(\sqrt{6})^2 = 2AH^2 \Rightarrow 6 = 2AH^2 \Rightarrow AH = \sqrt{3}$

$\frac{2\sqrt{3}}{1} = \frac{\sqrt{3}}{\sin C} \Rightarrow \sin C = \frac{1}{2} \Rightarrow C = 30^\circ$

$\frac{2\sqrt{3}}{1} = \frac{HC}{\frac{\sqrt{3}}{2}} \Rightarrow HC = 3$

ب)



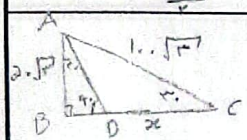
$\frac{9}{\frac{\sqrt{2}}{2}} = \frac{AH}{\frac{1}{2}} \Rightarrow AH = 3\sqrt{3}$

$(3\sqrt{6})^2 = (3\sqrt{2})^2 + BH^2 \Rightarrow 72 + BH^2 = 90 \Rightarrow BH = 3\sqrt{2}$

$AH = BH \Rightarrow A = B$, $A + B + 90 = 180$ $\Rightarrow B = 45^\circ$

۳

الف)



$\frac{AC}{1} = \frac{10\sqrt{3}}{\frac{1}{2}} \Rightarrow AC = 10\sqrt{3}$

$(10\sqrt{3})^2 = (5\sqrt{3})^2 + BC^2$

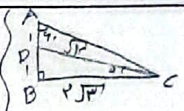
$300 = 75 + BC^2 \Rightarrow BC^2 = 225$

$\Rightarrow BC = 15$

$\frac{BD}{\frac{1}{2}} = \frac{5\sqrt{3}}{\frac{\sqrt{3}}{2}} \Rightarrow BD = 5$

$x = 15 - 5 = 10$

ب)



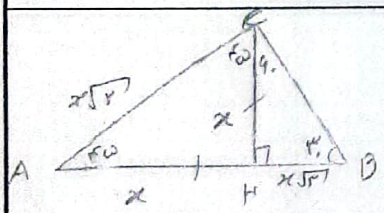
$\frac{2}{\frac{1}{2}} = \frac{BC}{\frac{\sqrt{3}}{2}} \Rightarrow BC = 2\sqrt{3}$

$(1)^2 + (2\sqrt{3})^2 = 1 + 12 = 13 = DC^2$

$\Rightarrow DC = \sqrt{13}$

$\frac{\sqrt{13}}{1} = \frac{1}{\sin\alpha} \Rightarrow \sin\alpha = \frac{1}{\sqrt{13}}$

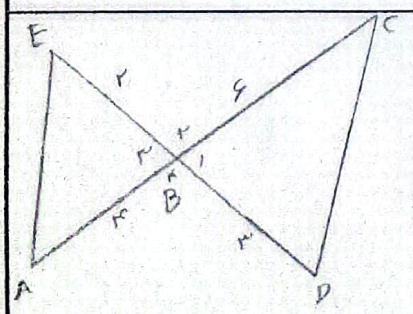
۴



$\frac{AB}{AC} = \frac{x + x\sqrt{3}}{x\sqrt{13}} = \frac{x(1+\sqrt{3})}{x\sqrt{13}} = \frac{1+\sqrt{3}}{\sqrt{13}}$

$\frac{x}{\frac{1}{2}} = \frac{AB}{\frac{\sqrt{13}}{2}} \Rightarrow AB = x\sqrt{13}$

۵

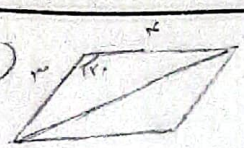


$\hat{B}_1 + \hat{B}_2 = 180^\circ$, $\hat{B}_2 + \hat{B}_3 = 180^\circ$ $\Rightarrow B_1 = B_3$

$\frac{S_{ABC}}{S_{DCD}} = \frac{\frac{1}{2} \times 4 \times 2 \times \sin B_1}{\frac{1}{2} \times 6 \times 3 \times \sin B_1} = \frac{4}{18} = \frac{2}{9}$

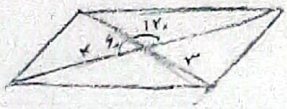
۶

الف)



$S = ۲ \times \frac{۱}{۲} \times ۲ \times ۳ \times \underbrace{\sin ۱۲۰^\circ}_{\frac{\sqrt{۳}}{۲}} = ۳\sqrt{۳}$

ب)

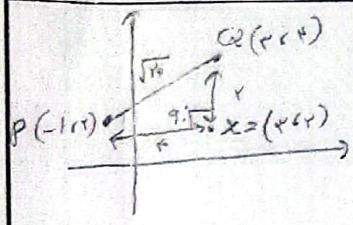


$S = \left(۲ \times \frac{۱}{۲} \times ۲ \times ۱/۵ \times \underbrace{\sin ۶۰^\circ}_{\frac{\sqrt{۳}}{۲}}\right) + \left(۲ \times \frac{۱}{۲} \times ۲ \times ۱/۵ \times \underbrace{\sin ۱۲۰^\circ}_{\frac{\sqrt{۳}}{۲}}\right) = ۲\sqrt{۳}$

ب

$S = \frac{۱}{۲} \times ۳ \times ۲ \times \sin ۱۲۰^\circ = ۳\sqrt{۳}$

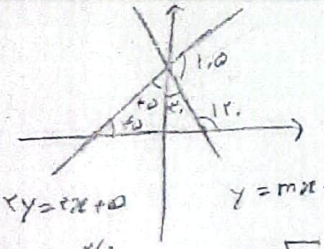
۷



$S_{\triangle QPx} = \frac{۱}{۲} \times ۲ \times ۳ = ۳$

$\cos p = \cos\theta = \frac{۳}{\sqrt{۱۰}} = \frac{۳}{\sqrt{۵}} = \frac{۳\sqrt{۵}}{۵}$

۸



$۲y = ۴x + ۵$

$\Rightarrow y = x + ۲/۵$

$y = mx + b$

$\Rightarrow y = -\sqrt{۳}x + ۲/۵$

$\Rightarrow mb = -\sqrt{۳} \times ۲/۵ = -۲/۵\sqrt{۳}$

۹

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

$\Rightarrow f\left(\frac{۵\pi}{۶}\right) = \cot ۱۵۰^\circ = -\sqrt{۳}$

۱۰

$\frac{\sin\left(\frac{۱۷\pi}{۲} + x\right) + \cos\left(\frac{۱۵\pi}{۲} - x\right)}{\cos(۳۲\pi + x) - \sin(۴\pi - x)} = \frac{\cos x - \cos x}{-\cos x + \sin x} = ۰$

$\frac{۱۷\pi}{۲} = ۸\frac{\pi}{۲}$, $\frac{۱۵\pi}{۲} = ۷\frac{۳\pi}{۲}$