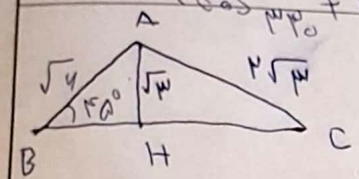
نام و نام خانوادگی ... پاسخنامه تشریحی تکلیف شماره ... کلاس ... نوبت ...

الف) $\left(\underbrace{\sin 135^\circ}_{\frac{\sqrt{2}}{2}} + \underbrace{\sin 300^\circ}_{-\frac{\sqrt{3}}{2}}\right)\left(\underbrace{\cos 315^\circ}_{\frac{\sqrt{2}}{2}} - \cos 120^\circ\right) = \frac{(\sqrt{2}-\sqrt{3})(\sqrt{2}+\sqrt{3})}{4} = \frac{2-3}{4} = -\frac{1}{4}$

ب) $\frac{1+3\tan^2 210^\circ}{5\cos^2 330^\circ + 2\cos^2 225^\circ} = \frac{\left(\frac{\sqrt{3}}{3}\right)^2 \times 3 + 1}{5\left(\frac{\sqrt{3}}{2}\right)^2 + 2\left(-\frac{\sqrt{2}}{2}\right)^2} = \frac{1+1}{\frac{15}{4}+1} = \frac{2}{\frac{19}{4}} = \frac{8}{19}$

۱

الف)



$\sqrt{4} \times \sin 45^\circ = AH = \sqrt{4} \times \frac{\sqrt{2}}{2} = \sqrt{3}$

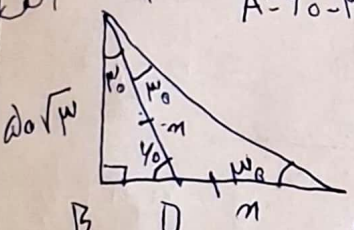
$HC^2 = (2\sqrt{3})^2 - (\sqrt{3})^2 = 12 - 3 = 9$

$\Rightarrow HC = \pm 3$

$HC = 3$

۲

الف)



$A = 90 - 30 = 60^\circ \quad \hat{A} = \hat{C}$

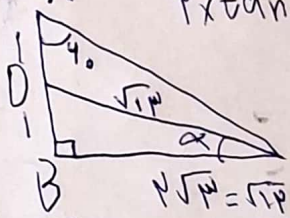
$\Rightarrow DC = AB = x$

$50\sqrt{3} \times \frac{1}{\cos 30^\circ} =$

$\frac{50\sqrt{3}}{\frac{\sqrt{3}}{2}} = 100$

$x = 100$

ب)



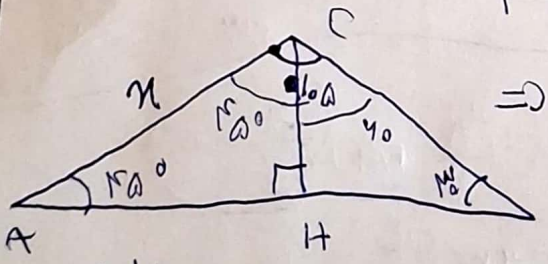
$2 \times \tan 60^\circ = BC = 2\sqrt{3}$

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

$\Rightarrow DC = \pm\sqrt{13}$

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

۳



$\Rightarrow x \times \sin 45^\circ = CH = \frac{\sqrt{2}}{2} x$

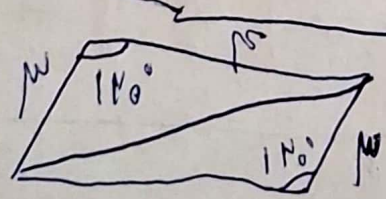
$CH \times \tan 60^\circ = BH = \frac{\sqrt{2}}{2} x \times \sqrt{3} = \frac{\sqrt{6}}{2} x$

$AB = AH + BH = \frac{\sqrt{2}}{2} x + \frac{\sqrt{6}}{2} x = \frac{\sqrt{2}+\sqrt{6}}{2} x$

$AH = x \times \cos 45^\circ = \frac{\sqrt{2}}{2} x$

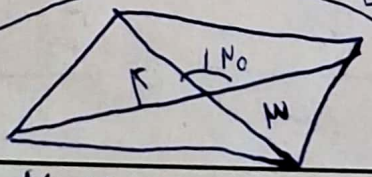
$\Rightarrow \frac{AB}{AC} = \frac{\frac{\sqrt{2}+\sqrt{6}}{2} x}{x} = \frac{\sqrt{2}+\sqrt{6}}{2}$

۴



$S = 2 \times \left(\frac{1}{2} \times 3 \times 3 \times \sin 120^\circ\right) = 9\sqrt{3}$

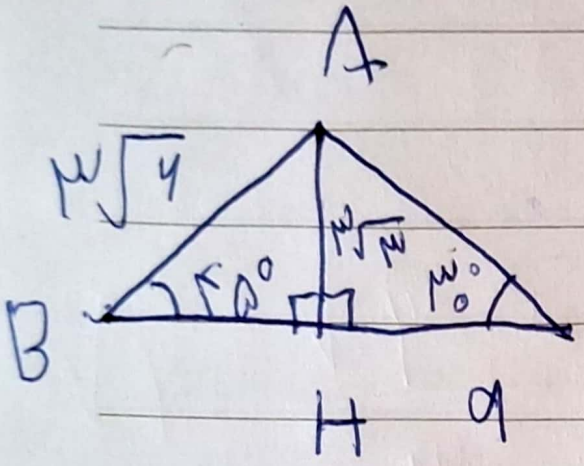
مساحت مثلث



$S = \frac{1}{2} \times 4 \times 3 \times \sin 120^\circ = 12 \times \frac{\sqrt{3}}{2} = 6\sqrt{3}$

جواب سوال ۶

Subject : ..... Day : ..... Month : ..... Year : .....



جواب ب) سوال ۲

$\Rightarrow \tan ۳۰ \times ۹ = AH = \frac{\sqrt{۳}}{۳} \times ۹ = ۳\sqrt{۳}$

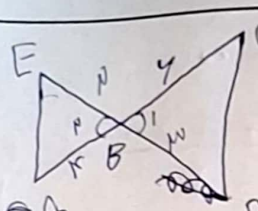
$\sin \hat{B} = \frac{۳\sqrt{۳}}{۳\sqrt{۴}} = \frac{۱}{\sqrt{۲}} = \frac{\sqrt{۲}}{۲} \Rightarrow$

$B + A = ۹۰$

$\hat{B} = ۴۵°$

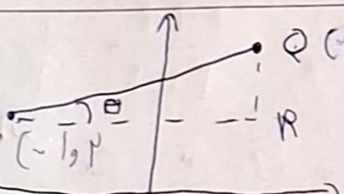
$B = ۴۵°$ یا $۱۳۵°$

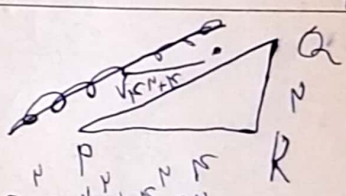
ولی چون B حاده است



$B_1 = B_2$

$$\frac{S_{\triangle ABE}}{S_{\triangle BCD}} = \frac{\frac{1}{2}\times 2\times 4\times \sin B_2}{\frac{1}{2}\times 3\times 6\times \sin B_1} = \frac{4}{9}$$



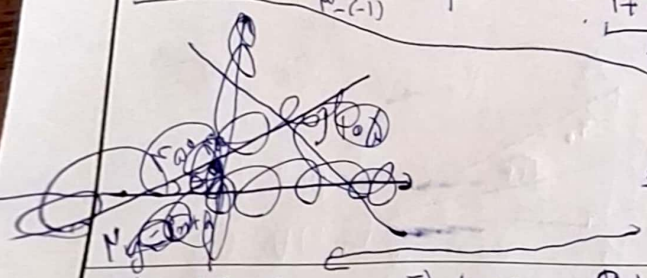


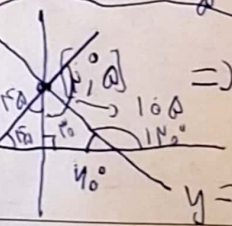
$PQ^2 = 2^2 + 4^2 = 20$ $\quad PQ = \pm\sqrt{20}$

$\cos\theta = \frac{PR}{PQ} = \frac{2}{\sqrt{20}} = \frac{2}{2\sqrt{5}} = \frac{\sqrt{5}}{5}$

$\tan\theta = \frac{4-2}{3-(-1)} = \frac{1}{2} = \tan\theta$ $\quad 1+\tan^2\theta = \frac{1}{\cos^2\theta}$

$\Rightarrow \cos^2\theta = \frac{1}{5}$ $\quad \Rightarrow \cos\theta = \pm\frac{\sqrt{5}}{5}$





$\log(5a+10a) = 3$ $\quad \Rightarrow b = 10$

$3y = 3x + 15$ $\quad y = mx + b$

$\Rightarrow y = x + 5$ $\quad \Rightarrow \tan\theta = 1$ $\quad \Rightarrow \theta = 45^\circ$

$mb = -\frac{\sqrt{3}}{2}\times\frac{5}{2} = -\frac{5\sqrt{3}}{4}$

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

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

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

$$= \cos\frac{11\pi}{4} - \sin\left(-\frac{\pi}{2}\right) - \tan\frac{11\pi}{4}$$

$$= \frac{\sqrt{2}}{2} - \frac{\sqrt{2}}{2} - \sqrt{2} = -\sqrt{2}$$

$\frac{11\pi}{4} = \frac{3\pi}{4} \rightarrow -\tan 45^\circ$

$$\frac{\sin\left(\frac{\pi}{2}+x\right) + \cos\left(\frac{15\pi}{2} - x\right)}{\sin\left(\frac{17\pi}{2}+x\right) + \cos\left(\frac{15\pi}{2} - x\right)} = \frac{\cos x + \sin x}{-\cos x + \sin x}$$

$$\frac{\cos(2\pi + x) - \sin(4\pi - x)}{\cos(2\pi + x) - \sin(-x)} = -\sin x$$