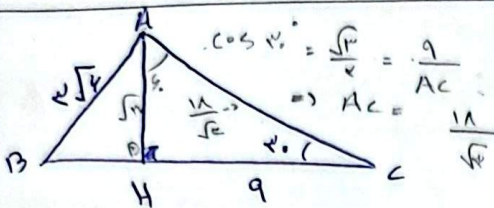


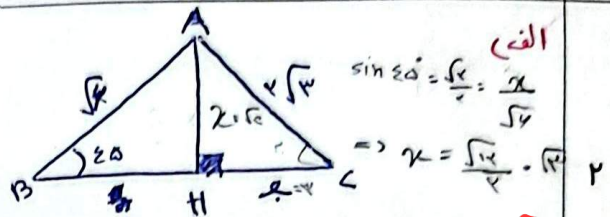
نام و نام خانوادگی: پاسخنامه تشریحی تکلیف شماره: ... کلاس: ...

الف) $(\sin 140^\circ + \sin 40^\circ)(\cos 310^\circ - \cos 130^\circ) = \left(\frac{\sqrt{3}}{2} + (-\frac{1}{2})\right)\left(\frac{\sqrt{3}}{2} - (-\frac{1}{2})\right)$
 $= \left(\frac{\sqrt{3}}{2} - \frac{1}{2}\right)\left(\frac{\sqrt{3}}{2} + \frac{1}{2}\right) = \frac{3}{4} - \frac{1}{4} = -\frac{1}{2}$ ✓

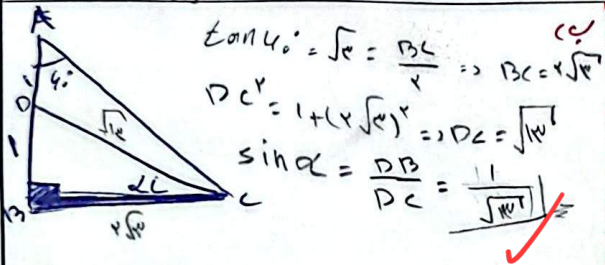
ب) $\frac{1 + 2 \tan^2 110^\circ}{2 \cos^2 44^\circ + 2 \cos^2 14^\circ} = \frac{1 + 2 \times (\frac{\sqrt{3}}{2})^2}{2 \times (\frac{\sqrt{3}}{2})^2 + 2 \times (\frac{\sqrt{3}}{2})^2} = \frac{4}{4} = 1$ ✓ (2)



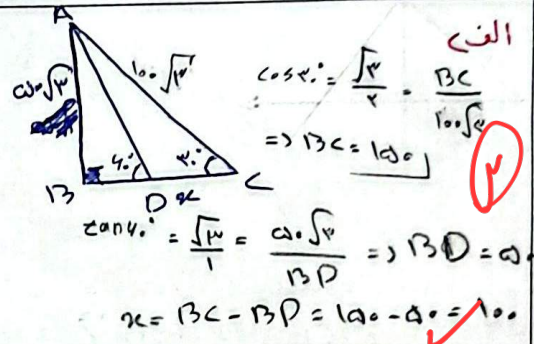
$(\frac{11}{\sqrt{2}})^2 = AH^2 + 11^2 \Rightarrow AH = \sqrt{11} = \sqrt{2} \times \sqrt{11/2}$
 $\sin B = \frac{\sqrt{2} \times \sqrt{11/2}}{11/\sqrt{2}} = \frac{\sqrt{2}}{\sqrt{2}} \Rightarrow B = 45^\circ$ ✓



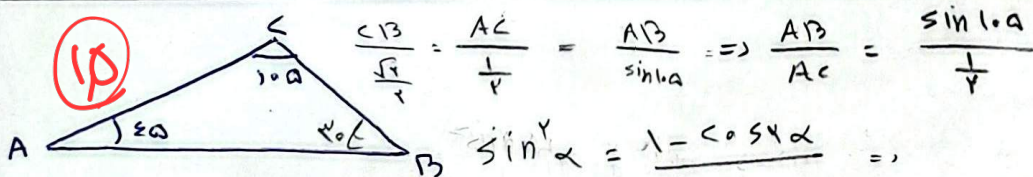
$(\sqrt{3})^2 = HC^2 + (\sqrt{2})^2 \Rightarrow HC = 1$ ✓ (2)



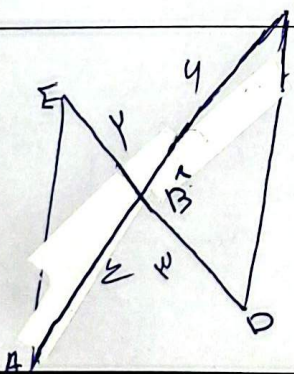
$\tan 40^\circ = \frac{1}{\sqrt{2}} = \frac{BC}{AC} \Rightarrow BC = \sqrt{2}$
 $DC^2 = 1 + (\sqrt{2})^2 \Rightarrow DC = \sqrt{3}$
 $\sin \alpha = \frac{DB}{DC} = \frac{1}{\sqrt{3}}$ ✓



$\tan 40^\circ = \frac{10}{10\sqrt{2}} = \frac{1}{\sqrt{2}} \Rightarrow BC = 10$
 $\angle B = 180^\circ - 40^\circ - 40^\circ = 100^\circ$ ✓



$\sin^2 \alpha = \frac{1 - \cos 40^\circ}{2} = \frac{1 - \cos 100^\circ}{2} = \frac{1 + \frac{\sqrt{2}}{2}}{2} \Rightarrow \frac{AB}{AC} = 1 + \frac{\sqrt{2}}{2}$



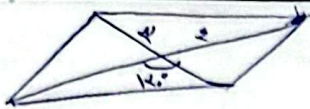
$\frac{S_{ABE}}{S_{BCD}} = \frac{\frac{1}{2} \times 1 \times 1 \times \sin B}{\frac{1}{2} \times 1 \times 1 \times \sin B} = \frac{1}{1}$ ✓ (2)

$AC = a \rightarrow \begin{cases} AH^2 + HC^2 = a^2 \\ AH = CH = \frac{a\sqrt{2}}{2} \end{cases}$

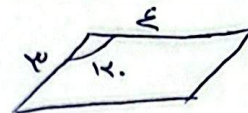
$\tan 40^\circ = \frac{a\sqrt{2}}{2} \rightarrow BH = \frac{a\sqrt{2}}{2} = \frac{a\sqrt{2}}{2}$

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

$\frac{AB}{AC} = \frac{a(\sqrt{2} + \sqrt{2})}{2a} = \frac{\sqrt{2} + \sqrt{2}}{2}$



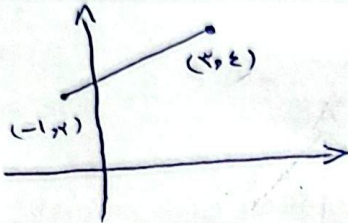
$$S = \frac{1}{2} \times 4 \times 4 \times \sin 120^\circ = 4 \times \frac{\sqrt{3}}{2} = 2\sqrt{3}$$



$$S = 4 \times 4 \times \sin 120^\circ = 4 \times 4 \times \frac{\sqrt{3}}{2} = 8\sqrt{3}$$

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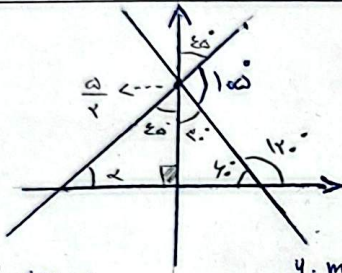


$$\alpha = \frac{\Delta y}{\Delta x} = \frac{1 - 2}{2 - (-1)} = -\frac{1}{3}$$

$$\alpha = \tan \theta = -\frac{1}{3}$$

$$1 + \tan^2 \theta = \frac{1}{\cos^2 \theta} \Rightarrow \cos \theta = \frac{3}{\sqrt{10}}$$

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$$y = x + a \Rightarrow a = 1$$

$$y = mx + b$$

$$\tan \alpha = 1 \Rightarrow \alpha = 45^\circ$$

$$m = \alpha = \tan 45^\circ = 1$$

$$b = \frac{a}{y}$$

$$\Rightarrow m \cdot b = 1 \times \frac{1}{1} = 1$$

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

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

$$= \cos \frac{\pi}{2} + \cos \frac{\pi}{2} + \cot \frac{\pi}{2} = 0 + 0 + 0 = 0$$

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$$\frac{\sin\left(\frac{13\pi}{4} + x\right) + \cos\left(\frac{13\pi}{4} - x\right)}{\cos\left(\frac{5\pi}{4} + x\right) - \sin\left(\frac{5\pi}{4} - x\right)} = \frac{+\cos x - \sin x}{-\cos x + \sin x} = \frac{-(\sin x - \cos x)}{\sin x - \cos x} = -1$$

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