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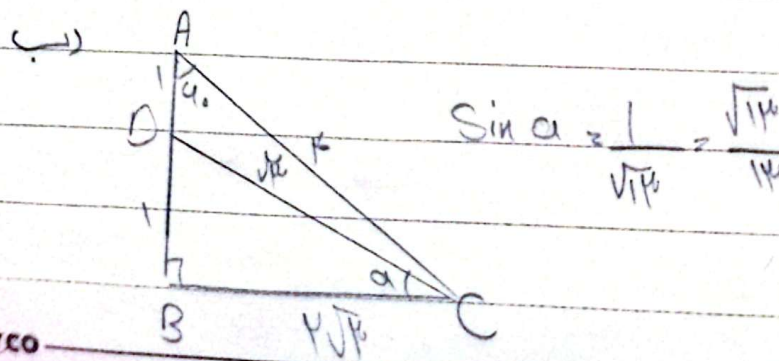
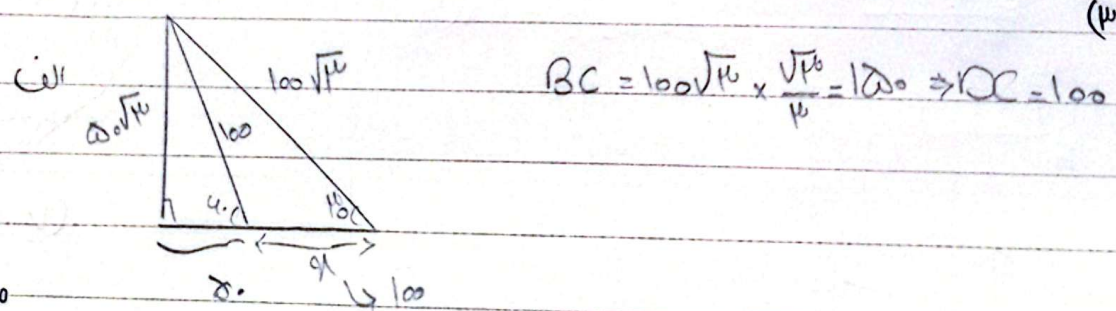
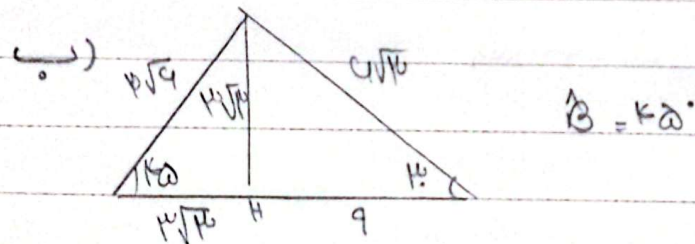
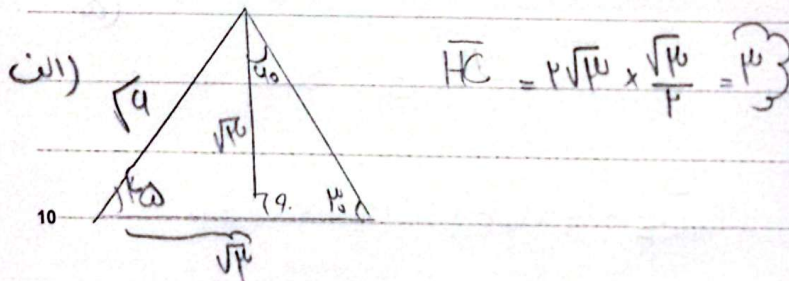
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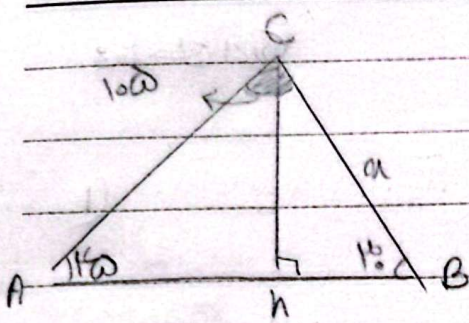
سوال بلا نم

$$\text{جواب)} (\sin 140^\circ + \sin 100^\circ)(\cos 140^\circ - \cos 100^\circ) = \left(\frac{\sqrt{14} - \sqrt{10}}{4}\right) \left(\frac{\sqrt{14} + \sqrt{10}}{4}\right) \quad (1)$$

$$\text{ب)} \frac{1 + \tan^2 \theta}{1 - \tan^2 \theta} = \frac{1 + \left(\frac{\sqrt{10}}{\sqrt{14}}\right)^2}{1 - \left(\frac{\sqrt{10}}{\sqrt{14}}\right)^2} = \frac{14}{14-10} = \frac{14}{4} = \frac{7}{2} \Rightarrow \frac{1}{\cos^2 \theta} = \frac{7}{2} \Rightarrow \cos^2 \theta = \frac{2}{7} \Rightarrow \cos \theta = \frac{\sqrt{14}}{7}$$



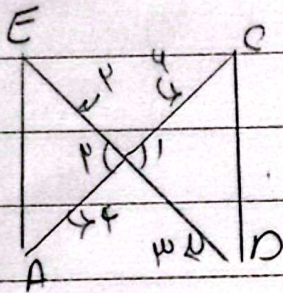
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$$AC = \sqrt{\frac{a^2}{k}} = \frac{a}{\sqrt{k}} \quad \frac{a}{\sqrt{k}} = \sqrt{P} \quad (1)$$

$$AB = \frac{a}{\sqrt{k}} + \frac{a\sqrt{k}}{\sqrt{k}} = \frac{a(1+\sqrt{k})}{\sqrt{k}} \Rightarrow \frac{AB}{AC} = \frac{a(1+\sqrt{k})}{\frac{a}{\sqrt{k}}} = \sqrt{k}(1+\sqrt{k})$$

$$= \frac{1+\sqrt{k}}{\sqrt{k}} \times \frac{\sqrt{k}}{\sqrt{k}} = \frac{\sqrt{k}+1}{1} \quad (2)$$

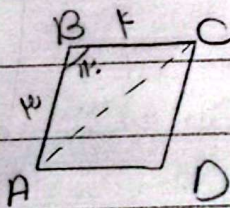


$$B_1 = B_2 \Rightarrow \sin B_1 = \sin B_2$$

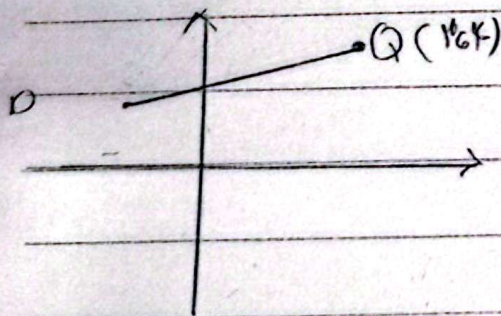
$$S_{\triangle ABE} = \frac{1}{4} \times \frac{1}{4} \times \frac{1}{4} \times \sin B_2 = \frac{1}{64} \sin B_2 \quad (3)$$

$$S_{\triangle BCD} = \frac{1}{4} \times \frac{1}{4} \times \frac{1}{4} \times \sin B_1 = \frac{1}{64} \sin B_1$$

$$\Rightarrow \frac{S_{\triangle ABE}}{S_{\triangle BCD}} = \frac{1}{1}$$



$$S_{ABCD} = \frac{1}{2} \times \left(\frac{1}{4} \times \frac{1}{4} \times \frac{1}{4} \times \sin 120^\circ \right) \times \frac{11\sqrt{3}}{4} \times \frac{1}{4} \quad (4)$$



$$\tan \alpha = \frac{y}{x} = \frac{1/2}{1/2} = 1 \Rightarrow \alpha = 45^\circ$$

$$\tan^2 \alpha + 1 = \frac{1}{\cos^2 \alpha} \Rightarrow \frac{1}{\cos^2 \alpha} = \frac{1}{\cos^2 \alpha}$$

$$\frac{1}{\cos^2 \alpha} = \frac{1}{\cos^2 \alpha} \Rightarrow \cos \alpha = \frac{1}{\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}} = \frac{1}{\sqrt{2}}$$

