

$$\frac{S_{BDE}}{S_{BDE'}} = \frac{1}{2}$$

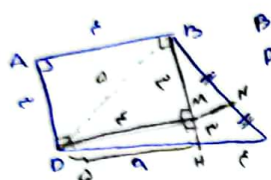
$$S_{BCE} = \frac{1}{2} \times BC \times EH$$

$$S_{BDE} = \frac{1}{2} \times DE \times BH'$$

$$DE \parallel BH \Rightarrow EH = BH' \text{ (مساوی)}$$

$$\frac{S_{BCE}}{S_{BDE}} = \frac{BC}{DE} \Rightarrow \frac{BC}{BE} = \frac{1}{2}$$

$$DE \parallel BC \Rightarrow \frac{AD+DB}{AB} = \frac{BC}{DE} = \frac{1}{2} \Rightarrow (I)$$



$$BH \parallel AD$$

$$DM \parallel AB$$

$$BDC = BDM$$

$$(BDC \text{ قائم الزویه})$$

$$\Rightarrow MN \leq \sqrt{2}$$

$$AD \parallel BM$$

$$AB \parallel DM$$

$$\hat{A} \leq 90^\circ$$

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$$DM^2 + MD^2 \leq DB^2 \Rightarrow DB \leq \sqrt{2}$$

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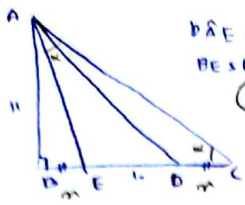
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$$\angle DAE = \angle ACD$$

$$\angle BEC = \angle ACB$$

$$\angle DAE = \angle ACD$$

$$\angle E = \angle E \Rightarrow \triangle AEC \sim \triangle AED \Rightarrow \frac{AE}{EC} = \frac{ED}{AE} \Rightarrow \frac{\sqrt{x^2+1}}{1+x} = \frac{1}{\sqrt{x^2+1}}$$

$$\frac{AE}{EC} = \frac{ED}{AE} \Rightarrow \frac{\sqrt{x^2+1}}{1+x} = \frac{1}{\sqrt{x^2+1}}$$

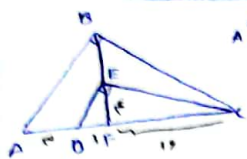
5

$$x^2+1 \leq 1 \dots + 1+x$$

$$x^2 = 1+x+1 \leq 1$$

$$(x-1)(x-1) \leq 0$$

6



$$\angle ABC = \angle EFC$$

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$$EF \leq DF \times FC$$

$$BC \leq AC \times FC \Rightarrow BC \leq \sqrt{10}$$

5



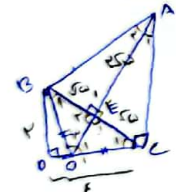
8) چون میانه و دو بر AC میانی است و هر دو به یکبار و دو بر یک خط میانی است پس مثلث قائم الزامی است (سایت نیست)

$$AB^2 = BC^2 + AC^2 \Rightarrow AB \leq BC \leq \sqrt{5}$$

$$AM \leq MB \leq \frac{AB}{2} \leq \sqrt{5}$$

$$MB \leq MC \Rightarrow BC^2 + MB^2 \leq MC^2 \Rightarrow \sqrt{5}^2 + (\sqrt{5})^2 \leq MC^2 \Rightarrow MC \leq \sqrt{10}$$

5



$$\angle BOC = \angle AOC$$

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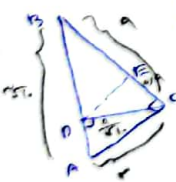
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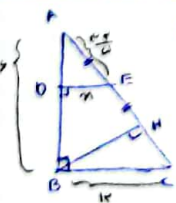
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$$DE \perp AB \Rightarrow DE \parallel BC$$

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$$DE \parallel BC \Rightarrow \frac{DE}{BC} = \frac{AE}{AC}$$

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$$\frac{DE}{BC} = \frac{AE}{AC} \Rightarrow \frac{DE}{12} = \frac{AE}{10} \Rightarrow DE = \frac{12 \times AE}{10}$$

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