

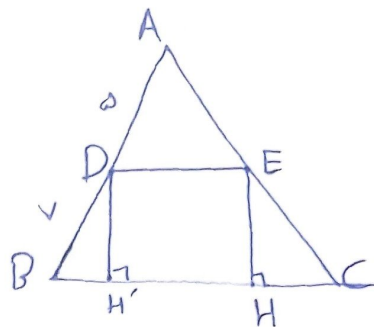
$$DE \parallel BC \rightarrow \frac{AD}{AB} = \frac{DE}{BC} \rightarrow BC = \frac{14}{5} DE$$

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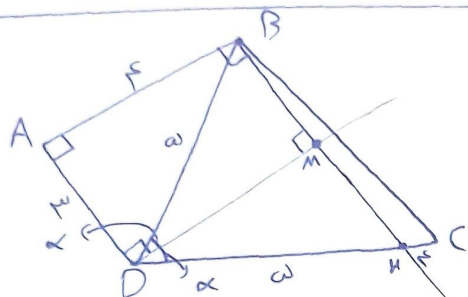
شایان روسزاده

$$\frac{S_{BCE}}{S_{BDE}} = \frac{EH \times BC}{DH \times DE} = \frac{14}{5} \times 1 = \boxed{2.8} \checkmark$$

$$DE \parallel BC \rightarrow DH' = EH$$



(2)



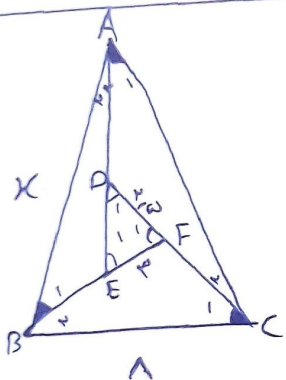
$$\left. \begin{array}{l} A = 90^\circ \\ AD \parallel BM \\ DM \parallel AB \end{array} \right\} \rightarrow ABCD \text{ is a parallelogram} \rightarrow BM = \frac{1}{2} BC, DM = \frac{1}{2} BC, DM \perp BH \rightarrow DM \text{ is the perpendicular bisector of } BH$$

$$\rightarrow OB = OM \text{ and } \angle OMB = \angle OBM \rightarrow MH = MB = \frac{1}{2} BC$$

$$\frac{CE}{CB} = \frac{MH}{HB} = \frac{1}{2} \rightarrow ME \parallel BC$$

$$\frac{ME}{HC} = \frac{BE}{BC} = \frac{1}{2} \rightarrow ME = \frac{1}{2} HC$$

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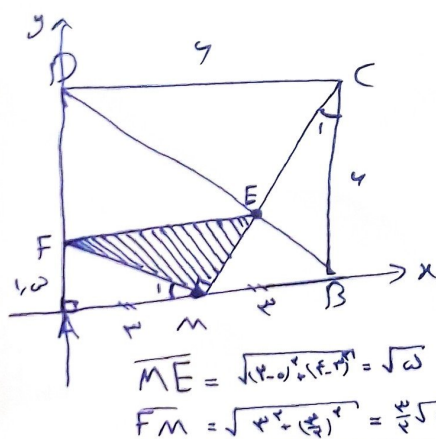
$$\left. \begin{array}{l} D_1 = A + C \\ A = C_1 \end{array} \right\} \rightarrow D_1 = C_1 + C_2 = C$$

$$\left. \begin{array}{l} F_1 = B + C_1 \\ C_1 = B_1 \end{array} \right\} \rightarrow F_1 = B_1 + B_2 = B$$

$$\therefore ABC \sim DEF$$

$$\frac{FE}{AB} = \frac{DE}{BC} \rightarrow \frac{4}{AB} = \frac{5}{14} \rightarrow AB = \boxed{9.8} \checkmark$$

(2)



$$\left. \begin{array}{l} A = B = 90^\circ \\ C_1 = M_1 \end{array} \right\} \rightarrow \angle C_1 B \cong \angle A M F \rightarrow \frac{BC}{AM} = \frac{BM}{AF} = \frac{MC}{FM}$$

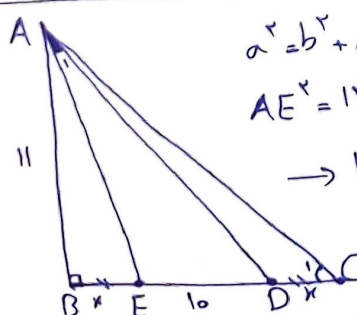
$$\rightarrow \frac{4}{4} = \frac{4}{AF} = \frac{MC}{FM} \rightarrow AF = 4 \rightarrow F \mid \frac{1}{2} AC, M \mid \frac{1}{2} AC$$

$$\rightarrow BD: m = \frac{0-4}{4-0} = -1 \rightarrow y_1 = -x+4$$

$$\rightarrow MC: m = \frac{4-0}{4-4} = \text{undefined} \rightarrow y_2 = 4x-4$$

$$\rightarrow S_{FME} = \frac{\sqrt{2} \times \frac{4}{5} \sqrt{2}}{2} = \boxed{\frac{16}{5}} \checkmark$$

(2)



$$a^2 = b^2 + c^2 - 2bc \cos A \rightarrow ED^2 = AE^2 + AD^2 - 2AE \cdot AD \cos A_1$$

$$AE^2 = 121 + x^2 \rightarrow AE = \sqrt{121 + x^2}, AD^2 = 121 + (10+x)^2 \rightarrow AD = \sqrt{x^2 + x + 121}$$

$$\rightarrow 100 = x^2 + 121 + 121 + (x+10)^2 - 2\sqrt{121 + x^2} \sqrt{x^2 + x + 121} \times \frac{10+x}{\sqrt{121 + x^2}}$$

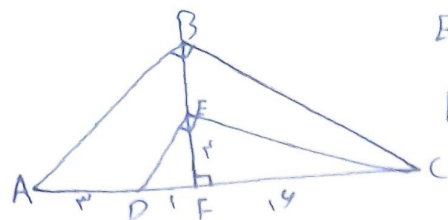
$$AE = \sqrt{x^2 + 121}$$

$$\left. \begin{array}{l} A_1 = C \\ \angle AED = \angle AEC \end{array} \right\} \rightarrow AED \sim AEC \rightarrow \frac{AE}{x+1} = \frac{10}{AE} \rightarrow x^2 + 121 = 100 + 10x \rightarrow x^2 - 10x + 21 = 0$$

$$\rightarrow \begin{cases} x = 3 \\ x = 7 \end{cases} \checkmark$$

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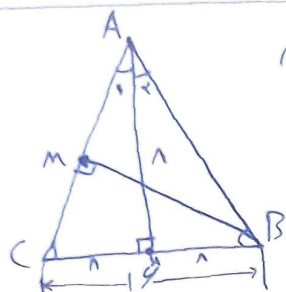
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$$EF^2 = DF \times FC \rightarrow 14 = 1 \times FC \rightarrow FC = 14$$

$$BC^2 = FC \times AC = 14 \times 20 \rightarrow \boxed{BC = 1\sqrt{5}} \checkmark$$

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$$MB = ? \quad AH = CH \rightarrow \hat{A} = \hat{C} = \hat{B} = \hat{A}$$

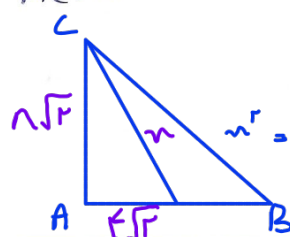
در مثلث متساوی الساقین، میان خطان ارتفاع است.

$$BC \perp AH$$

$$AC = \sqrt{14^2 + 14^2} = 1\sqrt{2} \checkmark$$

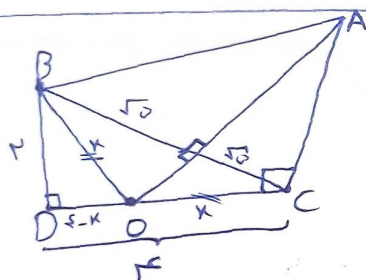
$$\Rightarrow AB = \frac{14 \times 1}{1\sqrt{2}} = \boxed{1\sqrt{2}} \checkmark$$

$$AC \times BM = AH \times BC$$



$$m^2 = (1\sqrt{2})^2 + (1\sqrt{2})^2 \rightarrow m = \boxed{2\sqrt{2}}$$

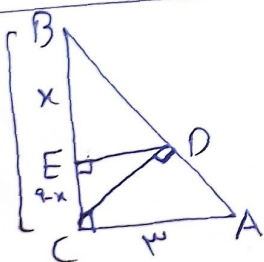
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تجربه تیر ۱۴۰۴ داخل

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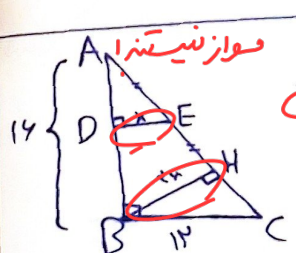
$$AB = \sqrt{7^2 + 7^2} = 7\sqrt{2} \quad \frac{AC}{BC} = \frac{CD}{9} \rightarrow \frac{7}{7\sqrt{2}} = \frac{CD}{9} \rightarrow CD = \frac{9}{\sqrt{2}}$$

$$\frac{BE}{BC} = \frac{ED}{AC} \rightarrow \frac{x}{9} = \frac{ED}{7} \rightarrow x = 9ED \rightarrow ED = \frac{x}{9}$$

$$\frac{x^2}{9} + (9-x)^2 = \frac{11}{10} \rightarrow -x^2 - 18x + 81 + \frac{x^2}{9} = \frac{11}{10} \checkmark$$

$$\frac{BD}{AB} = \frac{BE}{9} \rightarrow BD = \frac{7\sqrt{2}}{9} x \quad BD^2 = x(9) = BE \times BC \rightarrow \frac{10}{9} x^2 = 9x \rightarrow \boxed{x = \frac{81}{10}} \checkmark$$

(۲) ۹



$$\frac{AE}{AH} = \frac{DE}{BH} \rightarrow \frac{1}{7} = \frac{x}{BH} \rightarrow BH = 7x$$

$$AC = \sqrt{13^2 + 14^2} = \sqrt{4^2(3^2 + 4^2)} = 20, \quad BC^2 = CH \times AC \rightarrow CH = \frac{14^2}{20} = 7,2$$

$$144 = 4x^2 + (7,2)^2 \rightarrow x^2 = 23,04 \rightarrow \boxed{x = 4,8} \checkmark$$

تجربه اردیبهشت ۱۴۰۴ داخل

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