

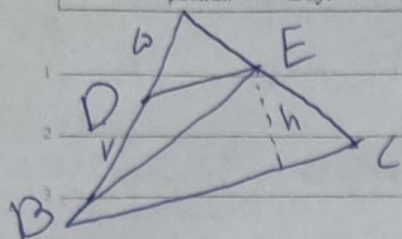
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بسم خدا

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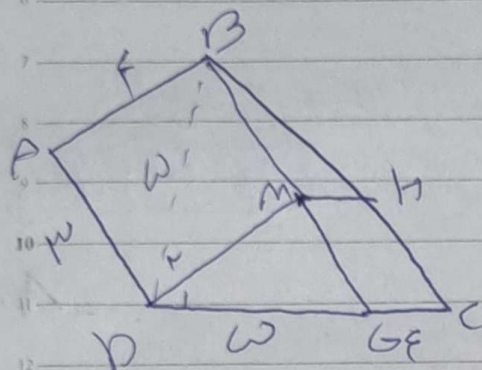
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$$\frac{AD}{AB} = \frac{DE}{BC} \Rightarrow \frac{10}{12} = \frac{DE}{BC} \Rightarrow BC = 12 \cdot \frac{10}{DE}$$

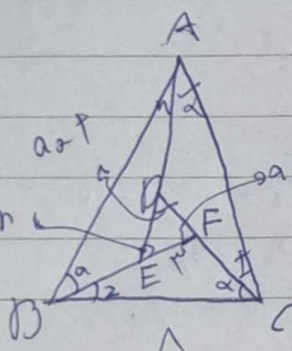
$$\frac{S_{BCE}}{S_{BDE}} = \frac{h \times \frac{1}{2} DE}{\frac{1}{2} h \times DE} = \frac{1}{2}$$

$$D_1 = D_2 / M = 90^\circ$$



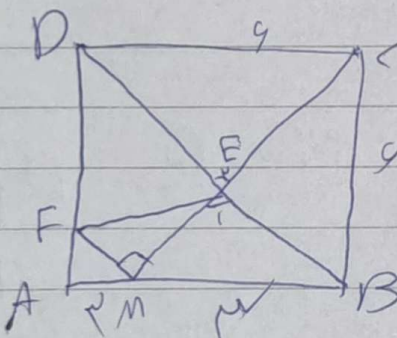
$$\hat{M}_1 = \hat{M}_2 = 90^\circ \Rightarrow \triangle BMD \sim \triangle DMG$$

$$\frac{MH}{GC} = \frac{1}{1} \Rightarrow MH = GC$$



$$\left\{ \begin{array}{l} \hat{E} = \hat{A} \\ \hat{C} = \hat{C} \\ \hat{F} = \hat{B} \end{array} \right\} \Rightarrow \triangle EFD \sim \triangle ABC$$

$$\frac{MB}{EF} = \frac{BC}{DF} \Rightarrow \frac{AB}{10} = \frac{1}{10} \Rightarrow AB = 10$$



$$MC^2 = BC^2 + MB^2 \Rightarrow MC = \sqrt{10}$$

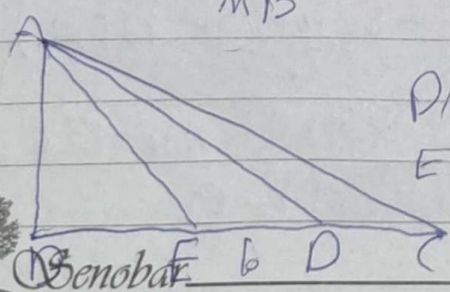
$$\left\{ \begin{array}{l} C = M \\ A = B = 90^\circ \end{array} \right\} \Rightarrow \triangle MAE \sim \triangle MBG$$

$$\frac{m}{r} = \frac{AF}{MF} \Rightarrow MF = \frac{m \cdot r}{AF}$$

$$\left\{ \begin{array}{l} E_1 = E_2 \\ D = B \end{array} \right\} \Rightarrow \triangle DEG \sim \triangle EMB$$

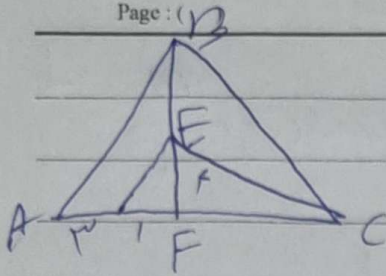
$$ME = EC \quad \frac{DC}{MB} = 1 \quad ME = \sqrt{10} \Rightarrow ME = \sqrt{10}$$

$$\frac{AF}{ME} = \frac{\sqrt{10} \times \sqrt{10}}{1} = 10$$



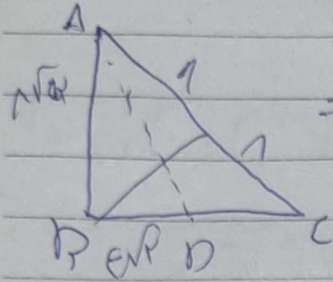
$$\left\{ \begin{array}{l} \angle AEF = \angle ACD \\ E = E \end{array} \right\} \Rightarrow \triangle AEG \sim \triangle AED$$

$$n^2 + 10 = (n+10) \cdot 10 \Rightarrow n^2 = 10n + 100 \Rightarrow n = 10$$



$$EF^2 = DF \times FC \Rightarrow 14 \times 1 = FC \Rightarrow FC = 14 \quad (2)$$

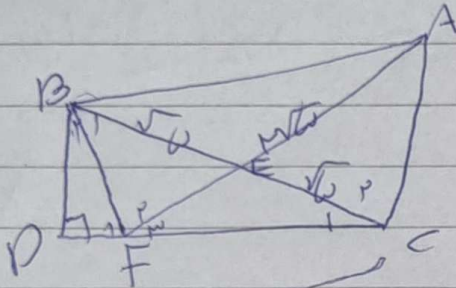
$$BC^2 = CF \times AC \Rightarrow BC^2 = 14 \times 20 \Rightarrow \sqrt{BC} = 1\sqrt{10} \quad \checkmark$$



$$\Rightarrow \cancel{BC}^2 = 14 \times 20 \Rightarrow n = 1\sqrt{10}$$

$$AD^2 = AB^2 + BD^2 \Rightarrow (1\sqrt{10})^2 + (1\sqrt{10})^2 = AD^2$$

$$\boxed{AD = 2\sqrt{10}} \quad \checkmark$$



$$B_1 = C_1$$

$$B_1 + B_2 + C_1 = 90$$

$$B_2 + 2B_1 = 90$$

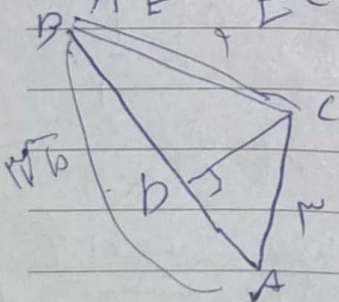
$$F_1 = C_1 + B_1 = 2B_1 \Rightarrow F_1 + F_2 + F_3 = 180 \Rightarrow B_1 + 2F_2 = 180$$

$$B_1 + F_2 = 90 \Rightarrow F_2 = B_1 + B_2$$

$$BC^2 = BD^2 + CD^2 \Rightarrow BC = 1\sqrt{10} \quad BE = EC = \sqrt{10}$$

$$\left. \begin{array}{l} C_1 = B = 2B_1 + B_2 \\ E = D = 90 \end{array} \right\} \Rightarrow \triangle ACE \sim \triangle BCD$$

$$\frac{DC}{AE} = \frac{BC}{EC} \Rightarrow AE = 1\sqrt{10} \Rightarrow \triangle ADE = \frac{1\sqrt{10} \times \sqrt{10}}{2} = 5 \quad \checkmark$$

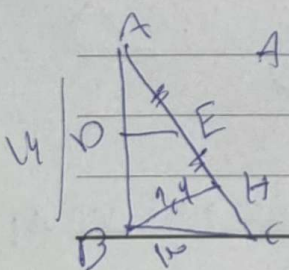


$$AB^2 = AC^2 + CB^2 \Rightarrow AB = 1\sqrt{10} \quad \alpha + B = 90$$

$$AC^2 = AD \times AB \Rightarrow 9 = n \times 1\sqrt{10} \Rightarrow n = \frac{9\sqrt{10}}{10}$$

$$\frac{9\sqrt{10}}{10} - \frac{1\sqrt{10}}{10} = \frac{8\sqrt{10}}{10} \quad BC^2 = BE \times BC$$

$$\Rightarrow \left(\frac{9\sqrt{10}}{10} \right)^2 = BE \times 9 \Rightarrow \boxed{BE = \frac{81}{10}} \quad \checkmark$$



$$AC^2 = BC^2 + AB^2 \Rightarrow AC = \sqrt{100} = 10$$

$$BH = \frac{14 \times 12}{20} = \frac{42}{5}$$

$$AH = \sqrt{14^2 - \left(\frac{42}{5} \right)^2} = \frac{56}{5}$$

$$AH = AE = \frac{56}{5}$$

$$A = A$$

$$D = H = 90$$

$$BH \times AC = AB \times BC = 10$$

$$\Rightarrow \triangle ADE \sim \triangle AHB \Rightarrow \frac{DE}{AH} = \frac{AE}{AB}$$

$$\Rightarrow DE = \frac{56}{5} \times \frac{56}{5} = \frac{3136}{25}$$