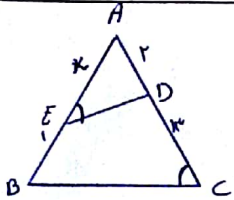


$$\left. \begin{array}{l} AE \parallel BC \\ \hat{E}_1 = \hat{F}_1 \\ \hat{D} = \hat{E} \\ \hat{A} = \hat{C} \end{array} \right\} \rightarrow \triangle AEF \sim \triangle FBC \Rightarrow \text{نسبت سائب} = 3$$

$$AB + AE = BE \rightarrow BE = \sqrt{10} \cdot m = 6 \Rightarrow EF = \frac{\sqrt{10}}{3} \cdot m$$

$$AC = AD + CD \rightarrow AC = \sqrt{10} \cdot n = 10 \Rightarrow AF = \frac{\sqrt{10}}{5} \cdot n \quad \frac{EF}{AF} = \frac{\frac{\sqrt{10}}{3} \cdot m}{\frac{\sqrt{10}}{5} \cdot n} = \boxed{\frac{\sqrt{5}}{3}}$$



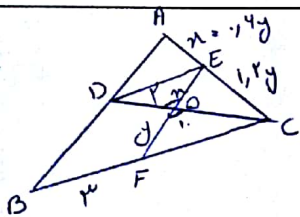
$$\left. \begin{array}{l} \hat{A} = \hat{A} \\ \hat{E} = \hat{C} \end{array} \right\} \rightarrow \triangle AED \sim \triangle ABC$$

$$\frac{AD}{AB} = \frac{ED}{BC} = \frac{AE}{AC} \rightarrow \frac{r}{10} = \frac{x}{14} \Rightarrow x + m = 10 \Rightarrow m + m - 10 = 0$$

$$(m-5)(m+4) = 0$$

$$x = -4 \text{ (رد)}$$

$$\boxed{x = 5}$$



$$m = 5 \Rightarrow x = 5$$

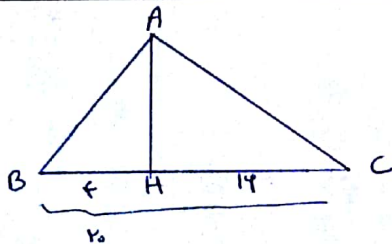
$$\frac{DE}{BC} = \frac{AE}{AC} = \frac{1}{3} \rightarrow BC = 3 \cdot DE$$

$$\left. \begin{array}{l} \hat{O}_1 = \hat{O}_2 \\ \hat{E} = \hat{F} \\ \hat{D} = \hat{C} \end{array} \right\} \rightarrow \triangle HDE \sim \triangle HCF$$

$$\frac{EH}{HF} = \frac{DE}{FC} = \frac{DH}{HC} = \frac{1}{2} \Rightarrow \frac{r}{5} = \frac{x}{5}$$

$$\frac{DE}{FC} = \frac{r}{5} \rightarrow \frac{DE}{FC + BF} = \frac{r}{5} \Rightarrow \frac{r}{10} = \frac{r}{5} \Rightarrow 9n = 2m + 10 \Rightarrow 5n = 10 \Rightarrow n = 2$$

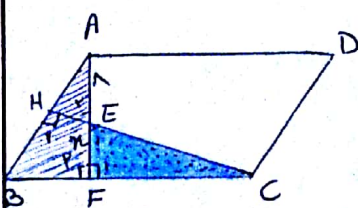
$$BC = 2m + 10 = \frac{10}{2} \times 2 + 10 = \boxed{\frac{10}{2}}$$



$$AC = CH \times BC \rightarrow AC = 14 \times 10 \Rightarrow AC = 140$$

$$AB = BH \times BC \rightarrow AB = 14 \times 10 \Rightarrow AB = 140$$

$$\frac{AB}{AC} = \frac{140}{140} = \boxed{\frac{1}{1}}$$



$$\hat{E}_1 = \hat{E}_2 \quad \hat{F}_1 = \hat{H}_1 = \hat{Q}_1 \Rightarrow \hat{A}_1 = \hat{C}_1$$

$$\left. \begin{array}{l} \hat{A}_1 = \hat{C}_1 \\ \hat{F}_1 = \hat{H}_1 \end{array} \right\} \rightarrow \triangle ABF \sim \triangle CEF \Rightarrow \frac{BF}{EF} = \frac{AF}{FC} \Rightarrow \frac{4}{n} = \frac{1+m}{1} \Rightarrow \boxed{\frac{4}{n} = \frac{1+m}{1}}$$

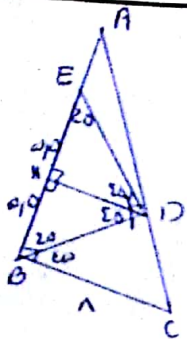
$$m + 14m = 4 \Rightarrow m + 14m - 4 = 0$$

$$(m+14)(m-2) = 0$$

$$m = -12 \text{ (رد)}$$

$$m = 2 \text{ (رد)}$$

$$AF = AE + EF = 1 + 2 = \boxed{3}$$



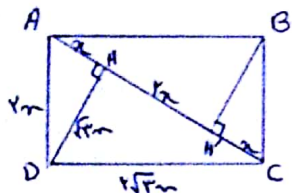
$$\left. \begin{array}{l} HD = HD \\ \angle AHD = \angle B \\ \angle AHD = \angle C \end{array} \right\} \triangle HDB \sim \triangle HDE \Rightarrow BH = HE \Rightarrow m = n \Rightarrow m = 4.1$$

$$BC \parallel HD \Rightarrow \frac{AH}{HB} = \frac{HD}{BC} \Rightarrow \frac{4.1}{m} = \frac{4.1}{14} \Rightarrow m = 14$$

$$m = 14 \Rightarrow n = 4.1$$

$$AE = 4.1$$

6



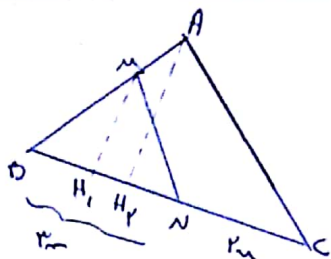
$$DH = AH + HC \Rightarrow DH = 4.1 + 14 = 18.1$$

$$AD = AH + DH \Rightarrow AD = 4.1 + 18.1 = 22.2$$

$$DC = DH + HC \Rightarrow DC = 18.1 + 14 = 32.1$$

$$\frac{S_{ABCD}}{S_{ADH}} = \frac{(18.1)(14)}{(4.1)(14)} = 4.4$$

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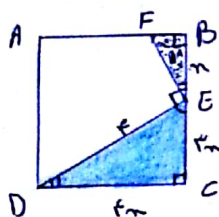


$$MN \parallel BC$$

$$\frac{S_{BMN}}{S_{ABC}} = \frac{MN^2}{BC^2} = \frac{4.1^2}{14^2} \Rightarrow \frac{MN}{BC} = \frac{4.1}{14} \Rightarrow MN = 4.1$$

$$\frac{BM}{AB - BM} = \frac{4.1}{14 - 4.1} \Rightarrow \frac{BM}{AM} = \frac{4.1}{9.9}$$

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$$\left. \begin{array}{l} \angle E = \angle D \\ \angle F = \angle C \end{array} \right\} \triangle EFB \sim \triangle DEC$$

$$\frac{DE}{EF} = \frac{DC}{BE} = \frac{CE}{FB} = 4$$

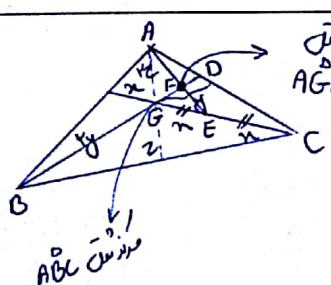
$$DC = 4BE, EC = 4FB$$

$$DE = DC + EC \Rightarrow 14 = 4m + 4n \Rightarrow m + n = 3.5 \Rightarrow m = 3.5 - n$$

$$DC = 4m = 4(3.5 - n) = 14 - 4n$$

$$S_{ABCD} = 14 \times 14 = 196$$

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$$\Rightarrow GF = \frac{4.1}{4}, FD = \frac{4.1}{4}$$

$$\frac{BD}{FD} = \frac{4.1 + 4.1}{4.1} = 2$$

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