

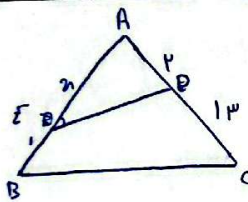
$$\left. \begin{array}{l} F_1 = F_2 \\ A = C \\ B = E \end{array} \right\} \triangle BFC \cong \triangle AFE$$

$$AC = 5 \rightarrow AF = \frac{3 \cdot 4}{5}$$

$$BE = 4 \rightarrow EF = \frac{4}{5}$$

$$\frac{EF}{AF} = \frac{\frac{4}{5}}{\frac{12}{5}} = \frac{1}{3}$$

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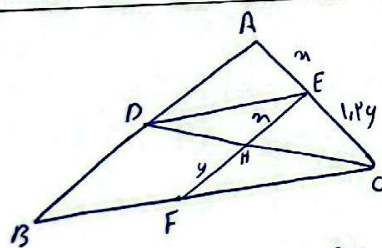


$$\left. \begin{array}{l} \hat{E} = \hat{C} \\ \hat{A} = \hat{A} \\ \hat{B} = \hat{D} \end{array} \right\} \triangle AED \cong \triangle ABC$$

$$\hookrightarrow \frac{AE}{AC} = \frac{AD}{AB} \rightarrow \frac{x}{14} = \frac{6}{10} \rightarrow x = \frac{42}{5}$$

$$x^2 + x = 10 \rightarrow x^2 + x - 10 = 0 \rightarrow x = 2 \text{ or } x = -5$$

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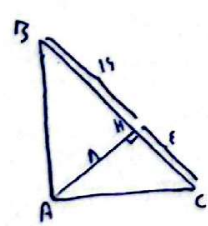
$$\frac{DE}{BC} = \frac{AD}{AB} = \frac{3}{10} \rightarrow BC = \frac{40}{3}$$

$$\frac{DE}{FC} = \frac{3}{7} \rightarrow FC = \frac{28}{3}$$

$$BC = 3DE = \frac{12}{3} = 4$$

$$\frac{DE}{BC} = \frac{DE}{\frac{40}{3}} = \frac{1}{3} \rightarrow 3DE = \frac{40}{3} \rightarrow DE = \frac{40}{9}$$

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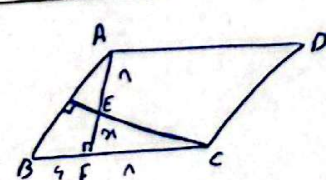
$$AH = \sqrt{14 \cdot 6} = 6$$

$$AC = 14$$

$$AB = \sqrt{14^2 + 6^2} = 15$$

$$\hookrightarrow \frac{AB}{AC} = \frac{15}{14}$$

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$$\triangle AFB \cong \triangle CFE$$

$$\frac{4}{1+x} = \frac{x}{1} \rightarrow x^2 + x - 4 = 0$$

$$\rightarrow x = 2 \text{ or } x = -4$$

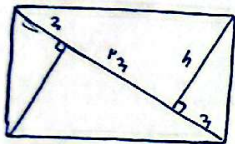
$$x^2 + x - 4 = 0$$

$$(x+4)(x-1) = 0$$

$$\rightarrow x = -4 \text{ or } x = 1$$

$$AF = 12$$

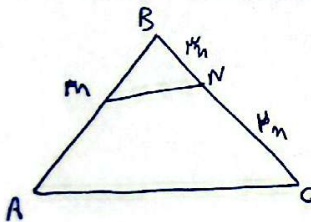
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مساحت مثلث = $\frac{1}{2} x h$ $\therefore \frac{x h}{r}$

مساحت مستطیل = $\frac{f x h}{r} \times r = f x h$

$\frac{f x h}{\frac{x h}{r}} = \boxed{\wedge}$

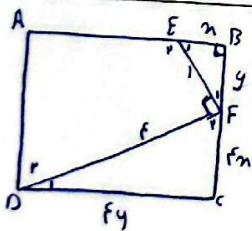


$S_{\triangle MBN} = \frac{1}{2} \sin B \times BN \times BM$

$S_{\triangle ABC} = \frac{1}{2} \sin B \times AB \times BC$

$\frac{BM}{AM} = \boxed{\frac{h}{h_m}}$

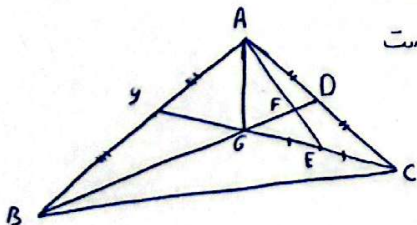
$\frac{S_{ABC}}{S_{MBN}} = r = \frac{AB \times BC}{BN \times BM} = \frac{AB}{MB} \times \frac{h}{h_m} = r \rightarrow \frac{AB}{MB} = \frac{r}{h}$



$\left. \begin{array}{l} F_1 + F_r = q_0 \\ F_1 + E_1 = q_0 \end{array} \right\} F_r = E_1$

$\left. \begin{array}{l} F_r = E_1 \\ F_1 = D_1 \end{array} \right\} \triangle FBE \cong \triangle DCF \rightarrow \frac{EF}{FD} = \frac{EB}{FC} = \frac{1}{f} = \frac{BF}{DC}$

$f y = f x + y \rightarrow x = \frac{r}{f} y \rightarrow \frac{9}{14} y^2 + y^2 = 1 \rightarrow y = \frac{f}{8} \rightarrow f y = \frac{14}{8} \rightarrow \left(\frac{14}{8}\right)^2 = \boxed{\frac{49}{20}}$



اگر میانه های مثلث یکدیگر را قطع کنند، خط نزدیک قاعده $\frac{1}{3}$ برابر خط دور از قاعده است

AGC مثلث، $\left\{ \begin{array}{l} \text{میانمضلع AE} \\ \text{میانمضلع GD} \end{array} \right\} \left\{ \begin{array}{l} GF = 2FD \\ FD = \frac{1}{3} GD \end{array} \right.$

$\frac{BD}{FD} = \frac{2GD}{\frac{1}{3}GD} = \boxed{4}$

ABC مثلث، $\left\{ \begin{array}{l} \text{میانمضلع cy} \\ \text{میانمضلع BD} \end{array} \right\} BG = 2GD$