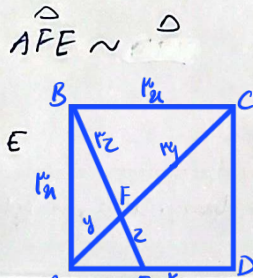


$$AD = AE + ED \quad ED = 2AE \quad AD = 3AE \quad \frac{AE}{AD} = \frac{1}{3}$$

$AD \parallel BC$
ضلعها
موازی

$$AF = \frac{1}{3} AC$$



$$\frac{AF}{AC} = \frac{AE}{AB} \rightarrow AB = AD \rightarrow \frac{AF}{AC} = \frac{AE}{AD} = \frac{1}{3}$$

$$BE^2 = (x_1)^2 + x^2 \rightarrow BE = \sqrt{10}x \rightarrow x + 2x = \sqrt{10}x \rightarrow x = \frac{\sqrt{10}}{3}x$$

$$(AC)^2 = (x_1)^2 + (x_2)^2 \rightarrow AC = \sqrt{5}x \rightarrow x_2 = \sqrt{5}x \rightarrow y = \frac{\sqrt{5}}{3}x$$

$$\frac{EF}{AF} = \frac{2}{3} = \frac{\sqrt{5}}{3}$$

$$\hat{AED} = \hat{ACB} \Rightarrow AED \sim ACB$$

$$\frac{AB}{AD} = \frac{AC}{AE} \rightarrow \frac{x+1}{x} = \frac{10}{x} \rightarrow x^2 + x = 10$$

$$x^2 + x = 10$$

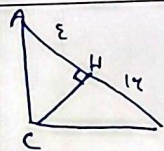
$$x = 2$$

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

$$\frac{BF}{BC} = \frac{x}{3x} = \frac{1}{3} \rightarrow \frac{BF}{BC} = \frac{1}{3} \rightarrow BC = 3BF$$

$$\frac{AE}{AC} = \frac{AD}{AB} = \frac{DE}{BC} \rightarrow \frac{x}{3x} = \frac{DE}{BC} \rightarrow BC = 3DE$$

$$DHE \sim CHF \rightarrow \frac{EH}{FH} = \frac{DH}{CH} = \frac{DE}{CF} \rightarrow \frac{4}{x} = \frac{DE}{CF} \rightarrow CF = \frac{3}{4} DE$$



$$CH^2 = AH \times HB \Rightarrow CH = 1$$

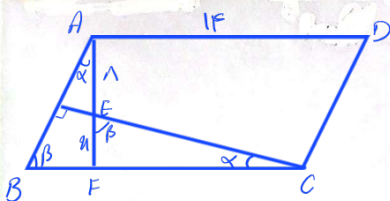
$$AC \times BC = AB \times CH \Rightarrow AC \times BC = 1 \times 2 = 2$$

$$AC^2 = AH \times AB \Rightarrow 2 \times 2 = 4 \Rightarrow AC = 2$$

$$BC = \frac{2}{2} = 1$$

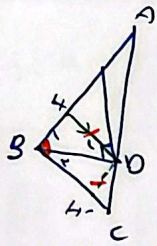
$$\frac{AC}{BC} = \frac{2}{1} = 2$$

$$AFB \sim CBH$$



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

$$AF = 1 + 1 = 2$$



$$D_1 = B_1 = B_p$$

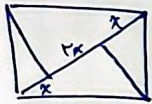
$$DH = CH'$$

$$EH = BH = \frac{11}{r} = y$$

$$\frac{11 + y}{11 + u} = \frac{y}{x} \rightarrow u = \frac{11y}{x}$$

6

6

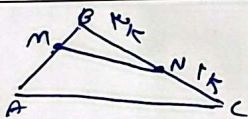


$$\frac{S_{\text{مستطیل}}}{S_{\text{مستطیل}}} = \frac{xy + xy + x + x + x + x}{x} = \frac{11x}{x} = 11$$

ع مثلث ارتفاع های برابر دارند . مساحت به نسبت مساحت ها تقسیم شود

7

7



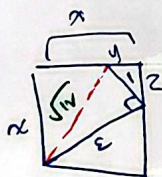
$$\frac{S_{BMN}}{S_{ABC}} = \frac{BM \cdot BN \cdot \sin B}{BA \cdot BC \cdot \sin B} = \frac{1}{16} \rightarrow \frac{BM}{BA} \times \frac{BN}{BC} = \frac{1}{16} \Rightarrow \frac{BM}{BA} = \frac{1}{4}$$

$$BA = BM + AM$$

$$AM = BA - BM = \frac{3}{4} BA \quad \frac{BM}{AM} = \frac{\frac{1}{4} BA}{\frac{3}{4} BA} = \frac{1}{3}$$

8

8



$$x^2 + (x-y)^2 = 17 \quad \sqrt{y^2 + 2^2 = 1} \quad (x-2)^2 + x^2 = 17$$

$$x^2 + 2^2 + y^2 - 2xy = 17 \rightarrow x^2 + 2^2 + y^2 - 2xy = 17 \rightarrow x^2 + 2^2 + y^2 - 2xy = 17$$

$$2x(2x - (2+y)) = 17 \rightarrow 2x(2x-1) = 17$$

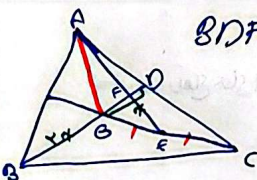
$$2x^2 - 2x = 17$$

$$BG = xy, GD = y \rightarrow BD = 2y$$

$$\left. \begin{array}{l} GF = \frac{1}{2}y \\ FD = \frac{1}{2}y \end{array} \right\} \rightarrow \frac{BD}{FD} = \frac{2y}{\frac{1}{2}y} = 4$$

9

9



$$BD = 3x$$

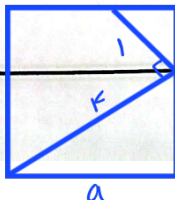
مساحت ها را به نسبت ۲ به ۱ تقسیم می کنند (مرکز ثقل مثلثاتی) میانه ها است

در مثلث ABC، میانه AE، BD، هم میانه و یکدیگر را قطع می کنند

$$\frac{BD}{FD} = \frac{3x}{x} = 3$$

به نسبت ۲ به ۱ تقسیم می شوند پس $BF = 2x, FD = x$

10



$$\frac{y}{a-x} = \frac{a}{a} = \frac{1}{F} \rightarrow \left. \begin{array}{l} a - Fx \\ a - x = Fy \end{array} \right\}$$

$$Fx - x = Fy \rightarrow x = \frac{Fy}{F-1}$$

$$F = (a-x)^2 + a^2 \rightarrow x = \frac{F}{a}, a = \frac{14}{a}$$

$$S_{\square} = a^2 = \frac{196}{16}$$

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