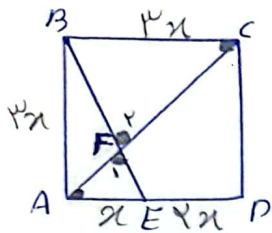


14,8



$$ED = 2AE \quad \frac{EF}{AF} = ?$$

$$\triangle FCB \sim \triangle FAE$$

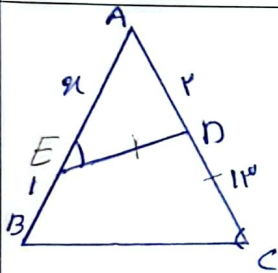
$$BE = (\sqrt{2}x)^2 + (x)^2 = \sqrt{10}x$$

$$AC = (\sqrt{2}x)^2 + (\sqrt{2}x)^2 = 2\sqrt{2}x$$

$$\frac{FE}{AF} = \frac{BE}{AC} = \frac{\sqrt{10}x}{2\sqrt{2}x} = \frac{\sqrt{5}}{2}$$

5

1



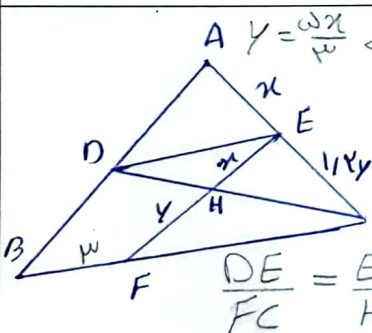
$$\angle AED = \angle ACB, \quad \angle E = \angle C$$

$$\frac{AE}{AC} = \frac{AD}{AB} \Rightarrow \frac{x}{3} = \frac{y}{2}$$

$$x(2) = 3y \Rightarrow x = 1.5y$$

5

2



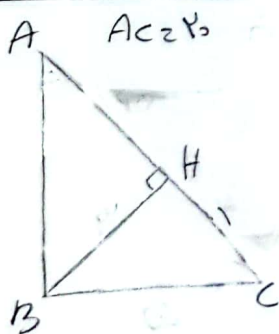
$$DE \parallel BC, \quad BF = 3, \quad BC = 5$$

$$\frac{AE}{AC} = \frac{DE}{BC} \Rightarrow \frac{x}{4} = \frac{1.2}{5}$$

$$\frac{DE}{FC} = \frac{EH}{HF} \Rightarrow \frac{DE}{FC} = \frac{x}{y} = \frac{3}{5} \Rightarrow 5DE = 3FC$$

5

3



$$BC^2 = \sqrt{10} \Rightarrow 6\sqrt{10}, \quad AB^2 = \sqrt{14} \Rightarrow 1\sqrt{14}$$

$$\frac{BC}{AB} = \frac{1}{\sqrt{14}}$$

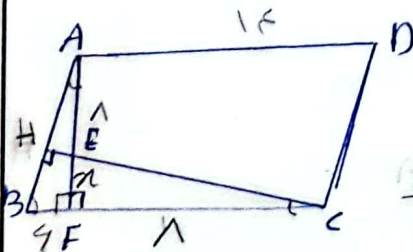
$$AB^2 = AH \times AC \Rightarrow 1\sqrt{14} = 14 \times 10 \Rightarrow 1\sqrt{14}$$

$$BC^2 = HC \times AC \Rightarrow 14 \times 10 \Rightarrow 1\sqrt{14}$$

$$\frac{BC}{AB} = \frac{1\sqrt{14}}{6\sqrt{10}} = \frac{1}{\sqrt{14}}$$

5

4



$$AD = 1, \quad AF = 1$$

$$BF = 1$$

$$AE = 1$$

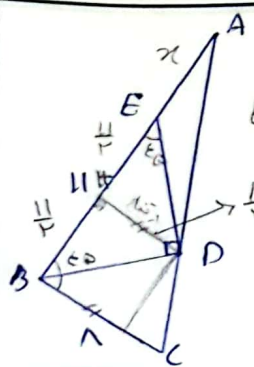
$$\angle B = \angle C, \quad \angle A = \angle D \Rightarrow \triangle ABF \sim \triangle DCF$$

$$\frac{BF}{EF} = \frac{AF}{CF} \Rightarrow \frac{1}{x} = \frac{1}{1+x} \Rightarrow x^2 + 1x - 1 = 0$$

$$\Rightarrow AF = AE + EF = 1 + 1 = 2$$

5

5



AE = 5

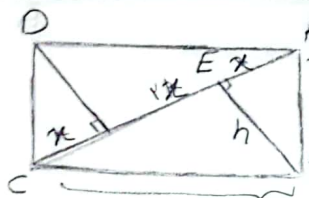
BD

EHD و BHD
مساحه الساقين

$$\Rightarrow HD \parallel BC \Rightarrow \frac{DH}{BC} = \frac{AH}{AB} \Rightarrow \frac{11}{12} = \frac{x+11}{x+11}$$

$$\frac{11}{12} (x+11) = 14 (x+11)$$

$$11x + 121 = 14x + 154 \Rightarrow 3x = 33 \Rightarrow x = 11$$



$$AC = 12x + 12x + 12x = 36x$$

$$L^2 + W^2 = 144x^2$$

$$S_{ABC} = \frac{1}{2} L W \Rightarrow L W = 36x$$

$$S_{ABC} = \frac{1}{2} AC \times BE = \frac{1}{2} (36x) h = 18xh$$

$$h = \frac{L W}{36x} = \frac{(12x)(12\sqrt{2}x)}{36x} = 12\sqrt{2}x$$

$$S_{ABE} = \frac{1}{2} \times 12x \times 12\sqrt{2}x = 72\sqrt{2}x^2$$

$$S_{ABE} = 12x \times 12\sqrt{2}x = 144\sqrt{2}x^2$$

$$\triangle ABE \sim \triangle ABC$$

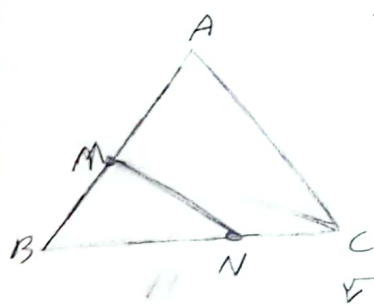
$$\frac{AE}{AB} = \frac{AB}{AC} \Rightarrow \frac{x}{12} = \frac{L}{36x}$$

$$L^2 = 36x^2 \Rightarrow L = 6x$$

$$(12x)^2 + W^2 = 144x^2$$

$$W = 12\sqrt{2}x$$

$$\frac{S_{ABE}}{S_{ABC}} = \frac{\frac{1}{2} \times 12x \times 12\sqrt{2}x}{\frac{1}{2} \times 36x \times 12\sqrt{2}x} = \frac{1}{3}$$



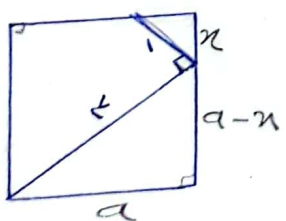
$$S_{ABC} = 9 S_{BMN}$$

$$1/BN = 1/NC$$

$$\frac{BN}{NC} = \frac{1}{1}$$

$$\frac{S_{BMN}}{S_{ABC}} = \frac{BM}{BA} \times \frac{BN}{BC}$$

$$1/12 = \frac{BM}{12} \times \frac{1}{1} \Rightarrow \frac{BM}{12} = \frac{1}{12} \Rightarrow \frac{BM}{BA} = \frac{1}{9}$$

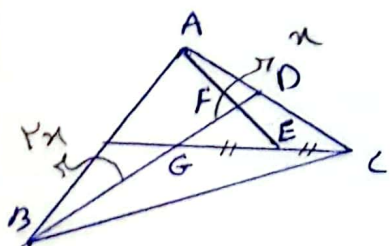


$$\frac{y}{a-x} = \frac{x}{a} = \frac{1}{x} \Rightarrow a-x = \frac{a}{x}$$

$$a-x-x = \frac{a}{x} \Rightarrow x = \frac{a}{2}$$

$$a^2 = (a-x)^2 + a^2 \Rightarrow x = \frac{a}{2} \Rightarrow a = \frac{14}{3}$$

$$S = a^2 = \frac{196}{9}$$



$$GE = EC$$

G مركز ثقل

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

$$BG = 12x \quad GD = x \Rightarrow BD = 13x$$

$$\begin{cases} GF = \frac{1}{3}x \\ FD = \frac{1}{3}x \end{cases} \Rightarrow \frac{BD}{FD} = \frac{13x}{\frac{1}{3}x} = 39$$

$$\frac{S_{ABC}}{S_{BMN}} = \frac{\frac{1}{2} \times AB \times BC \times \sin B}{\frac{1}{2} \times BM \times BN \times \sin B} = 9$$

$$\frac{AB}{BM} = \frac{1}{a} \Rightarrow \frac{AB-BM}{BM} = \frac{1}{a} \Rightarrow \frac{BM}{AM} = \frac{a}{1}$$