

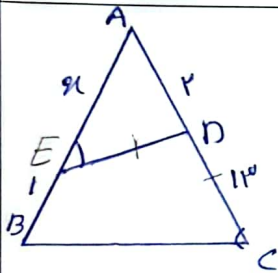
$$ED = 2AE \quad \frac{EF}{AF} = ?$$

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

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

$$AC = (\sqrt{3}x)^2 + (\sqrt{3}x)^2 = 3\sqrt{2}x$$

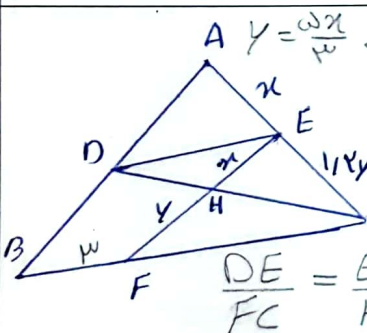
$$\frac{FE}{AF} = \frac{BE}{AC} = \frac{\sqrt{10}x}{3\sqrt{2}x} = \frac{\sqrt{5}}{3}$$



$$\angle AED = \angle ACB, \quad x = ?$$

$$\frac{AE}{AC} = \frac{AD}{AB} \Rightarrow \frac{x}{1} = \frac{2}{x+1}$$

$$x(x+1) = 2 \Rightarrow x = 1$$



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

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

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

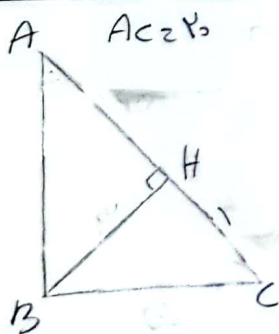
$$\frac{3}{5} \Rightarrow \begin{cases} 3 + FC = 5 \\ 5DE = 3FC \end{cases} \Rightarrow 3 + FC = 5 \Rightarrow FC = 2$$

$$FC = 2$$

$$BC = FC + BF = 2 + 3 = 5$$

$$BC = 5$$

$$(9/5)$$



$$BC^2 = \sqrt{10} \Rightarrow 5\sqrt{10}, \quad AB^2 = \sqrt{10} \Rightarrow 1\sqrt{10}$$

$$\frac{BC}{AB} = \frac{1}{5}$$

$$AB^2 = AH \times AC \Rightarrow 1 \times 10 = \sqrt{10} \Rightarrow 5\sqrt{10}$$

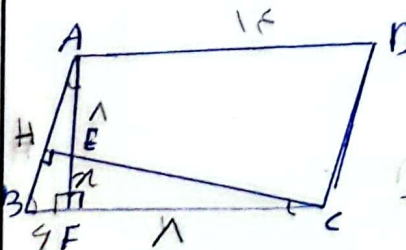
$$BC^2 = HC \times AC \Rightarrow 14 \times 10 = 1\sqrt{10}$$

$$\frac{BC}{AB} = \frac{1\sqrt{10}}{5\sqrt{10}} = \frac{1}{5}$$

$$\begin{cases} HC = 14 \\ AH = 14 \end{cases}$$

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$$AD = 1 \quad AF = ?$$

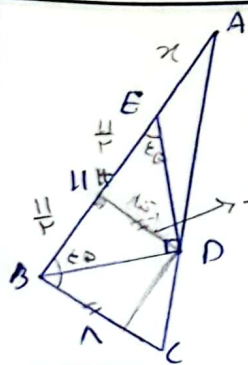
$$BF = 4$$

$$AE = 1$$

$$\hat{B} = \hat{B} \Rightarrow \triangle ABF \sim \triangle CGF$$

$$\frac{BF}{EF} = \frac{AF}{CF} \Rightarrow \frac{4}{x} = \frac{1+x}{1} \Rightarrow x^2 + 1 = 4x \Rightarrow x = 3$$

$$\Rightarrow AF = AE + EF = 1 + 3 = 4$$



AE = 5

BD = 14

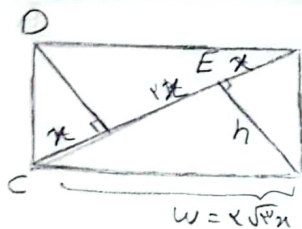
EHD و BHD
مستقيم الساقين

$$\Rightarrow HD \parallel BC \Rightarrow \frac{DH}{BC} = \frac{AH}{AB} \Rightarrow \frac{11}{14} = \frac{x+11}{x+14}$$

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

$$11x + 154 = 14x + 154 \Rightarrow 3x = 0 \Rightarrow x = 0$$

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$$AC = 2x + x + x = 4x$$

$$L^2 + W^2 = 14x^2$$

$$S_{ABC} = \frac{1}{2} L W \Rightarrow L W = 4x^2$$

$$S_{ABC} = \frac{1}{2} AC \times BE = \frac{1}{2} (4x) h = 2xh$$

$$h = \frac{L W}{4x} = \frac{(2x)(2\sqrt{2}x)}{4x} = \sqrt{2}x$$

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

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

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

$$\frac{AE}{AB} = \frac{AB}{AC} \Rightarrow \frac{x}{2x} = \frac{L}{4x}$$

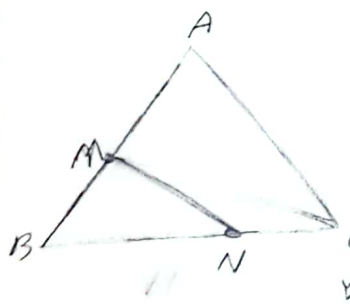
$$L = 2x$$

$$(2x)^2 + W^2 = 14x^2$$

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

$$\frac{S_{ABE}}{S_{ABC}} = \frac{\frac{\sqrt{2}}{2} x^2}{2\sqrt{2} x^2} = \frac{1}{4}$$

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

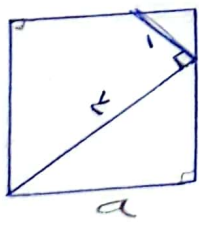
$$BN = NC$$

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

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

$$\frac{1}{9} = \frac{BM}{BA} \times \frac{1}{2} \Rightarrow \frac{BM}{BA} = \frac{2}{9}$$

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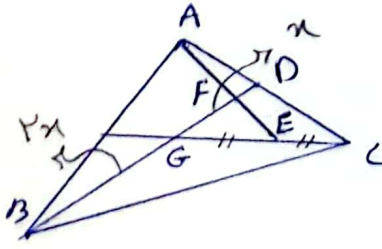
$$\frac{y}{a-x} = \frac{x}{a} = \frac{1}{2} \Rightarrow a-x = 2y$$

$$a-x = 2y \Rightarrow x = \frac{a}{3}$$

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

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

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$$GE = EC$$

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

$$BG = 2x \quad GD = x \Rightarrow BD = 3x$$

$$\begin{cases} GF = \frac{1}{3}x \\ FD = \frac{1}{3}x \end{cases} \Rightarrow \frac{BD}{FD} = \frac{3x}{\frac{1}{3}x} = 9$$

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