

$$ED = 2AE$$

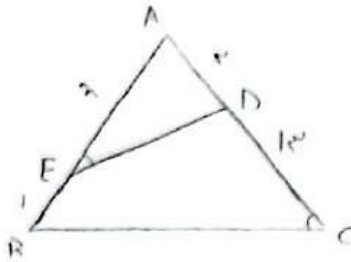
$$\frac{AE}{EC} = \frac{AF}{FC} = \frac{EF}{FR}$$

$$\frac{1}{2} = \frac{AF}{FC} = \frac{EF}{FR}$$

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

$$AC^2 = (2)^2 + (2)^2 \Rightarrow AC = 4\sqrt{2}$$

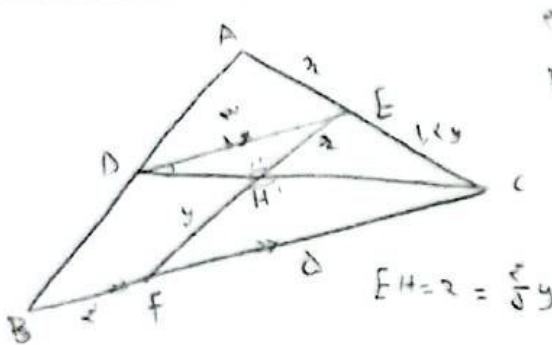
$$\frac{EF}{AF} = ? = \frac{EF = \frac{BE}{2}}{AF = \frac{AC}{2}} \Rightarrow \frac{EF}{AF} = \frac{BE}{AC} = \frac{\sqrt{10} \cdot 2}{4\sqrt{2}} = \boxed{\frac{\sqrt{10}}{2}}$$



$$\left. \begin{array}{l} \hat{AED} = \hat{ACB} \\ \hat{A} = \hat{A} \\ \hat{B} = \hat{D} \end{array} \right\} \Rightarrow \triangle ADE \sim \triangle ABC$$

$$\Rightarrow \frac{2}{10} = \frac{x}{2+1} \Rightarrow 2^2 + 2 = x \quad 2x + 2 = 0$$

$$(2-x)(2-x) \Rightarrow x = 2$$

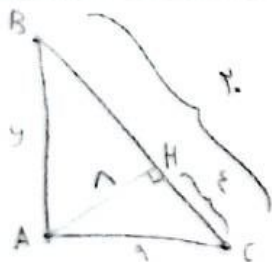


$$BF = 2$$

$$\left. \begin{array}{l} H_1 = H_2 \\ F = E \\ D = C \end{array} \right\} \Rightarrow \triangle H_1 E \sim \triangle H_2 F$$

$$\frac{EH}{FH} = \frac{DE}{FC} \Rightarrow \frac{2y}{y} = \frac{2}{FC} \Rightarrow FC = 0$$

$$\Rightarrow BC = BF + FC = 2 + 0 = \boxed{2}$$

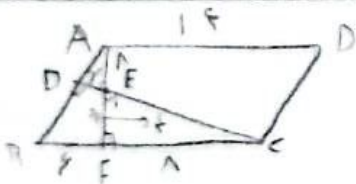


$$AH^2 = 14 \Rightarrow AH = \sqrt{14}$$

$$2^2 = 8 \times 14 \Rightarrow 2 = \sqrt{14}$$

$$y^2 = 14 \times 14 \Rightarrow y = \sqrt{14}$$

$$\frac{2}{y} = \frac{8\sqrt{14}}{14\sqrt{14}} = \frac{1}{2} \Rightarrow \frac{2}{y} = \frac{1}{2} \Rightarrow y = 4$$



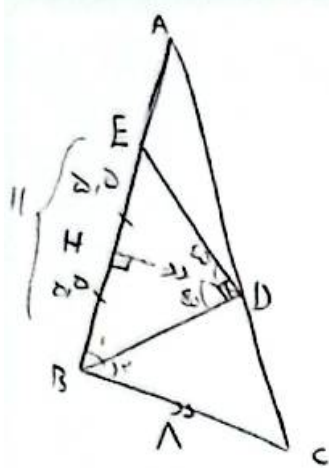
$$\left. \begin{array}{l} E_1 + C = 90^\circ \\ F_1 = E_1 \\ E_2 + A = 90^\circ \end{array} \right\} \Rightarrow A = C \Rightarrow \triangle EFC \sim \triangle ABF$$

$$CF = 12 - y = 8$$

$$AF = 8 + 4 = \boxed{12}$$

$$\frac{EF}{BF} = \frac{CF}{AF} \Rightarrow \frac{2}{y} = \frac{8}{8+4} \Rightarrow \frac{2}{y} = \frac{2}{3} \Rightarrow y = 3$$

$$(2, 14)(2, 14) \Rightarrow 2 \times 14 = 28$$



$$HD \parallel BC \Rightarrow B = H = 90^\circ \Rightarrow B_1 = B_2 = 90^\circ$$

$$\boxed{4, 4} - 9$$

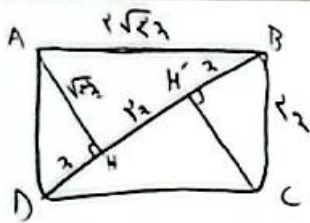
$$B_1 + H = 90 + 90 = 180 \text{ in } \triangle B_1 H \Rightarrow D_1 = 90 \Rightarrow D_2 = 90$$

$$DH = (4, 0) \Rightarrow DH = 4, 0$$

$$\frac{AH}{AB} = \frac{HD}{BC} = \frac{4 + 4, 0}{4 + 11} = \frac{4, 0}{11} \Rightarrow 11 \times 4 = 4, 0 \times 11 \Rightarrow 44 = 4, 0 \times 11$$

$$4, 0 \times 11 = 44$$

$$11 = \frac{44}{4, 0} = 11$$



$$AH' = \sqrt{2} \Rightarrow AH = \sqrt{2}$$

$$AR' = \sqrt{2} \times \sqrt{2} = 2 \Rightarrow AR = 2$$

$$BC' = 2 \times \sqrt{2} = 2\sqrt{2} \Rightarrow BC = 2\sqrt{2}$$

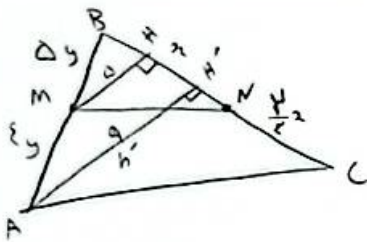
$$S_{ADH} = \frac{\sqrt{2} \times 2}{2} = \frac{\sqrt{2}}{1} \times 2 = 2\sqrt{2}$$

$$S_{AHD} = S_{BCH'}$$

$$\frac{S_{ARCD}}{S_{AHD}} = \frac{2 \times \sqrt{2} \times 2}{\sqrt{2} \times 2} = 2$$

$$\boxed{1}$$

-V



$$\frac{BM}{AM} = ?$$

$$S_{MBN} = \frac{h \times x}{2}$$

$$S_{ABC} = \frac{h' \times \frac{\Delta}{2}}{\frac{\Delta}{2}}$$

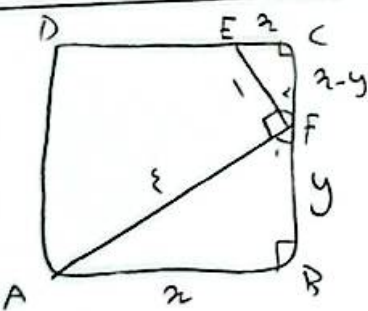
$$\Rightarrow \frac{S_{ABC}}{S_{MBN}} = 1 = \frac{h' \times \frac{\Delta}{2} \times 2}{h \times x} = \frac{h' \times \Delta}{h \times x}$$

$$9h = \Delta h'$$

$$\frac{h}{h'} = \frac{\Delta}{9}$$

$$\frac{BM}{AB} = \frac{MH}{AH'} = \frac{\Delta}{9} \Rightarrow \frac{BM}{AM} = \frac{\Delta}{9} = \boxed{\frac{\Delta}{9}}$$

-A



$$\left. \begin{array}{l} \hat{B} = \hat{C} \\ F_1 = E \\ F_2 = A \end{array} \right\} \Rightarrow \triangle FCE \sim \triangle ABF$$

$$\Rightarrow \frac{FE}{AF} = \frac{CF}{AB} = \frac{CE}{FB}$$

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

$$x_2 - x_1 = 2$$

$$x_2 = x_1$$

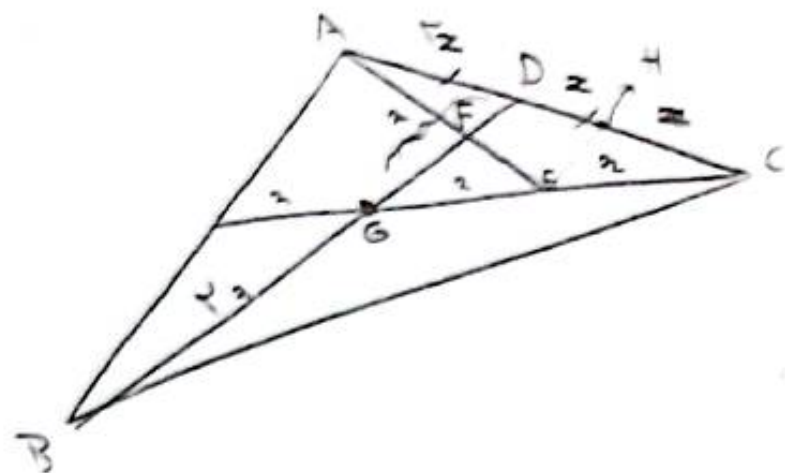
$$\frac{x}{2} = y$$

$$S = 2^2 =$$

$$x = 2^2 + \frac{9}{14} \times 2^2$$

$$14 = \frac{20}{14} \times 2^2 \Rightarrow 2^2 = \frac{14 \times 14}{20} = \boxed{10, 24}$$

-9



$$EH \parallel GD \Rightarrow \frac{EC}{GE} = \frac{CH}{DH} \xrightarrow{EC=EG} \quad \text{--- 1.}$$

$$\frac{CH}{DH} = 1 \Rightarrow CH = DH$$

$$FD \parallel EH \rightarrow \frac{AD}{AH} = \frac{FD}{EH} = \frac{2}{2} = \frac{FD}{EH}$$

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

$$EH \parallel DG \rightarrow \frac{CH}{CD} = \frac{EH}{GD} = \frac{2}{2} = \frac{EH}{GD}$$

$$GD = 2 EH \rightarrow GD = 2 \left(\frac{2}{2} FD \right) \Rightarrow GD = 2 FD$$

$$\frac{GD}{BD} = \frac{1}{3}$$

$$\frac{2 FD}{BD} = \frac{1}{3} \Rightarrow \frac{BD}{FD} = \boxed{9}$$