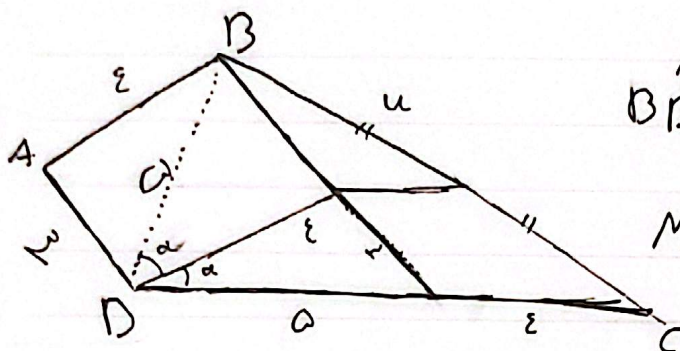


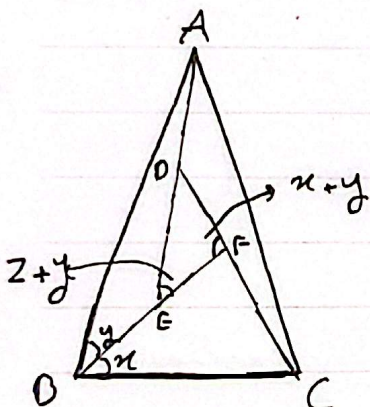
$$DE \parallel BC \Rightarrow \frac{AD}{AB} = \frac{DE}{BC} = \frac{5}{12}$$

$$\frac{S_{\triangle BCE}}{S_{\triangle DOE}} = \frac{\frac{h \times BC}{2}}{\frac{h \times DE}{2}} = \frac{12}{5}$$



$$\triangle BDM \cong \triangle DGM \Rightarrow MG = r$$

$$MN \parallel GC \Rightarrow \frac{BN}{BC} = \frac{MN}{GC} \Rightarrow MN = r$$

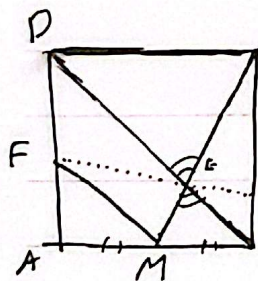


$$\triangle DEF \sim \triangle ABC$$

$$\frac{AC}{DE} = \frac{BC}{DF} = \frac{AB}{EF} \Rightarrow \frac{1}{2} = \frac{AB}{r} \Rightarrow$$

$$AB = 2r$$

$$\triangle AMF \sim \triangle BCM \quad \hat{B} = \hat{A}$$



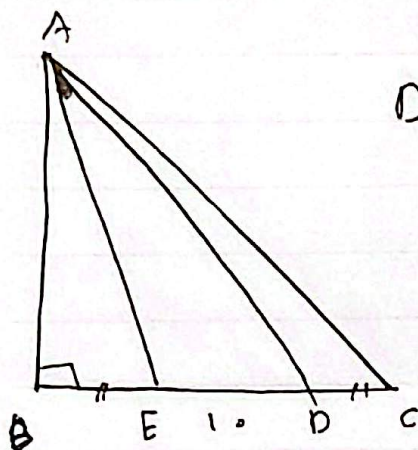
$$C \frac{y}{r} = \frac{r}{k} \Rightarrow AF = k = \frac{r}{2} \quad FM^2 = AF^2 + AM^2 \Rightarrow \sqrt{\frac{r^2}{4} + \frac{r^2}{4}} = \frac{r}{\sqrt{2}}$$

$$\triangle DCE \sim \triangle BEM \Rightarrow \left[ME = \frac{1}{2} CE \right] \Rightarrow ME = \frac{r}{\sqrt{2}}$$

$$S_{\triangle FME} = \frac{ME \times FM}{2} = \frac{\frac{r}{\sqrt{2}} \times \frac{r}{\sqrt{2}}}{2} = \frac{r^2}{4} = \frac{1}{4} r^2$$

who cares if one more light goes out

one more light

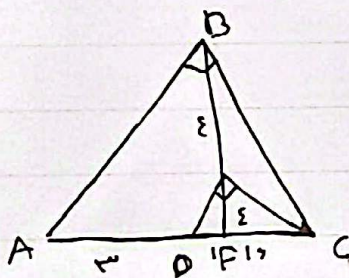
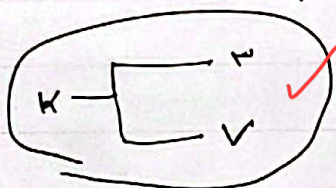


$$DC = BE = k$$

$$\left. \begin{matrix} \angle A = \angle A \\ \hat{E} = \hat{E} \end{matrix} \right\} \Rightarrow \triangle AED \sim \triangle AEC$$

$$\frac{AE}{k+1} = \frac{AD}{AC} = \frac{1}{1+k} \Rightarrow AE = 1 \cdot (1+k) \quad (1)$$

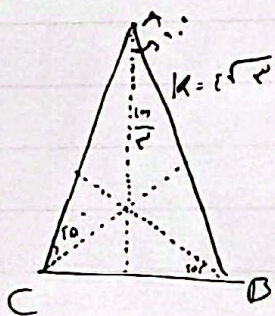
$$1 + k = AE \Rightarrow (1) \Rightarrow 1 + k = 1 \cdot (1+k) \Rightarrow$$



$$EF = DF \cdot FC \Rightarrow 1 = FC$$

$$BF = AF \cdot FC \Rightarrow 1 = BF \Rightarrow \boxed{BF = 1}$$

$$BF + FC = BC \Rightarrow 1 + 1 = BC \Rightarrow BC = 2 \Rightarrow \sqrt{a}$$



$$CH \cdot HB = AH \cdot HD \Rightarrow 1 \cdot 1 = AH \cdot HD \Rightarrow \boxed{AH \cdot HD = 1}$$

$$AB^2 = AH^2 + HB^2 \Rightarrow AB = \sqrt{2} \Rightarrow k = \sqrt{2}$$

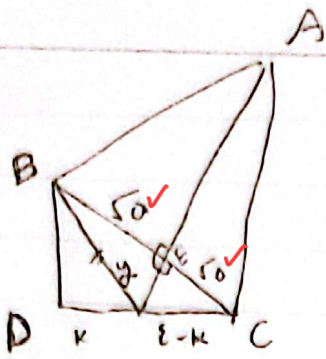
$$HB = AH \Rightarrow 1 = AH \Rightarrow \hat{A} + \hat{B} + \hat{C} = 180^\circ$$

$$\forall x + x = 180^\circ$$

$$CN \perp BM = \omega AH \Rightarrow \left[\begin{matrix} CN = 1 \\ BM = 1 \end{matrix} \right] \Rightarrow CN \perp BM = \sqrt{2}$$

$$x = \sqrt{2}$$

● dotnote



$$C = 90^\circ$$

$$BD^2 + DC^2 = BC^2 \Rightarrow BC = \sqrt{10} \quad \checkmark$$

(1) - A

$$\left. \begin{array}{l} x + x^2 = y^2 \\ x - x = y \end{array} \right\} \Rightarrow y^2 = 1^2 + x^2 - 1^2 \Rightarrow : AEC \sim BCD$$

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

$$EO^2 = \frac{10}{x} \Rightarrow \frac{\sqrt{10}}{x}$$

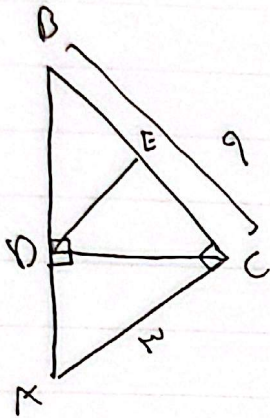
$$\frac{1}{x} = \frac{1}{k} \quad \frac{1}{\sqrt{10}} = \frac{1}{AE} \rightarrow AE = \sqrt{10}$$

$$S_{ABE} = \frac{1}{2} AE \times BE = 5$$

$$OC^2 = EO \times OA$$

$$\frac{10}{x} = \frac{\sqrt{10}}{x} \times AO \Rightarrow AE = AO \times EO = \frac{\sqrt{10}}{x} \times \frac{10}{x} = \frac{10\sqrt{10}}{x^2}$$

$$AO = \frac{10\sqrt{10}}{x^2}$$



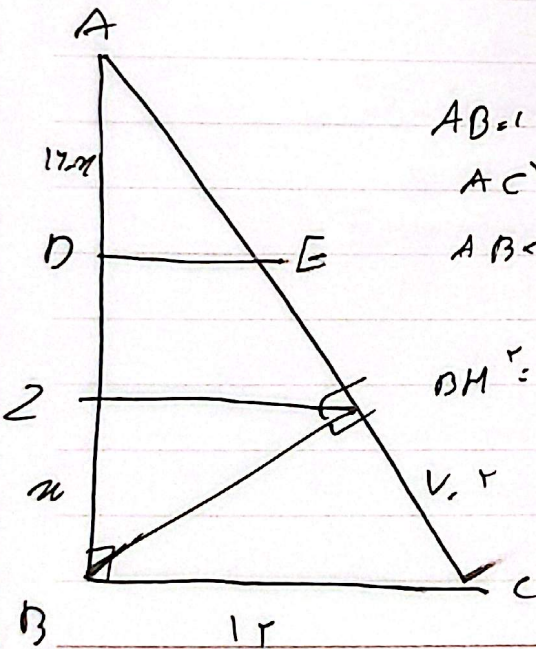
$$BA^2 = BC^2 + CA^2 \quad BA = \sqrt{10}$$

$$BC \times AC = AB \times DC \Rightarrow DC = \frac{9\sqrt{10}}{10}$$

$$DC^2 = EC \times BC \Rightarrow \frac{1}{10} = 9 \quad EC = \frac{9}{10}$$

$$BE = BC - EC = \frac{9}{10} - \frac{9}{10} = \frac{1}{10} = 1,1 \quad \checkmark$$

(2)



$$AB = 12 \quad BC = 16$$

$$AC^2 = AB^2 + BC^2 \Rightarrow AC = 20$$

$$AB \times BC = AC \times BH \Rightarrow 12 \times 16 = 20 \times BH$$

$$BH = \frac{192}{20} \quad \checkmark$$

$$BH^2 = x^2 \times 16 \Rightarrow \frac{192^2}{20^2} = x^2 \times 16 \Rightarrow x^2 = \frac{192^2}{20^2 \times 16} \Rightarrow x = \frac{192}{20} = 9,6$$

$$\triangle ADE \sim \triangle ABC \Rightarrow \frac{AE}{AC} = \frac{DE}{BC} = \frac{9,6}{20} = \frac{DE}{16} \Rightarrow$$

$$DE = 7,68 \quad \checkmark$$

$$DC^2 = CH \times AC = 16 \times 16 = CH \times 20 \Rightarrow CH = 12,8$$

$$AH = AC - CH = 20 - 12,8 = 7,2 \Rightarrow AE = EH = 7,2 \quad \checkmark$$