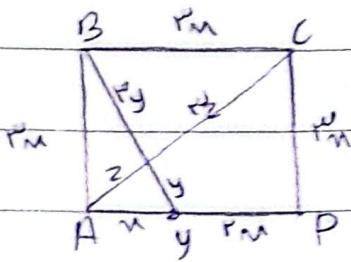


المسألة الأولى

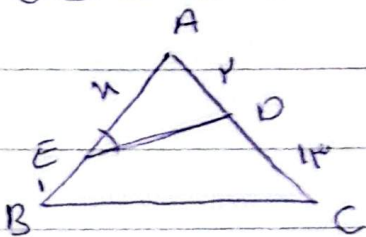


$$\sqrt{(r-m)^2 + m^2} = m\sqrt{1} = BE = r - y \rightarrow y = \frac{m\sqrt{1}}{r}$$

$$\triangle AEF \sim \triangle BCF \rightarrow \frac{FE}{FB} = \frac{AF}{FC} = \frac{AE}{BC}$$

$$\frac{y}{z} = \frac{\frac{m\sqrt{1}}{r}}{\frac{r-m}{r}} = \frac{\sqrt{1}}{r}$$

$$\sqrt{r(m-z)^2} = r-m \sqrt{r} \Rightarrow r-z \rightarrow z = \frac{r-m\sqrt{r}}{r}$$



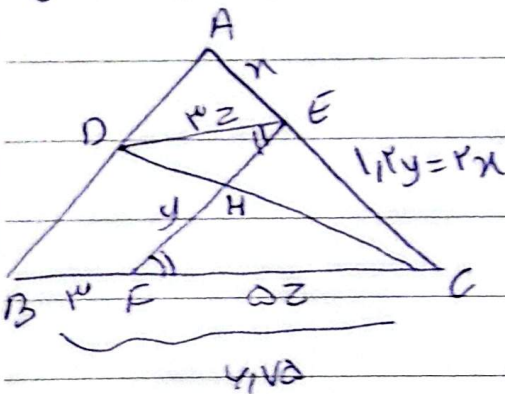
$$\triangle AED \sim \triangle ACB \rightarrow \hat{A} = \hat{A} \quad \left. \begin{array}{l} \hat{AED} = \hat{ACB} \\ \hat{ADE} = \hat{ABC} \end{array} \right\} \rightarrow \triangle AED \sim \triangle ACB$$

$$\frac{r}{x+1} = \frac{x}{10} \rightarrow r = x^2 + x$$

$$x^2 + x - r = 0 \rightarrow (x+4)(x-2) = 0$$

$$\downarrow$$

$$x = 2$$



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

$$r_y = \Delta m$$

$$y = \frac{\Delta}{r} x$$

$$\triangle AED \sim \triangle ABC \rightarrow \frac{m}{x+1/r_y} = \frac{DE}{BC} = \frac{1}{r}$$

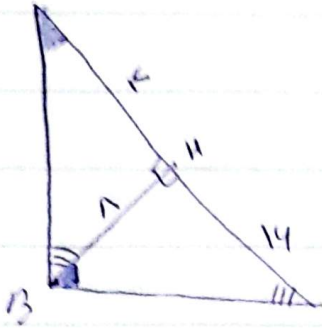
$$\triangle DEH \sim \triangle FCH$$

$$\frac{x}{y} = \frac{DE}{RF} = \frac{r}{\Delta}$$

$$\Rightarrow \frac{x}{x+1/r_y} = \frac{x}{y+r} \quad \left. \begin{array}{l} \Rightarrow x+r = \frac{\Delta}{r} x + r \\ \Rightarrow r = \frac{\Delta}{r} x + r \end{array} \right\}$$

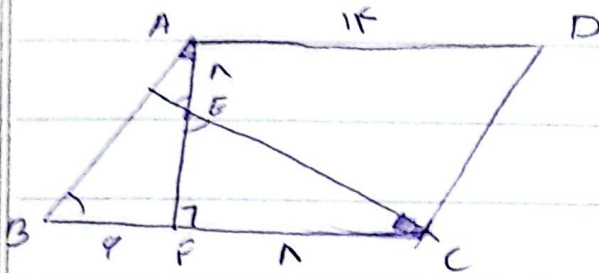
$$\Delta z + r = \Delta z \quad z = \frac{r}{r}$$

$$\Delta z = 4 \times 10$$



$$AH \times CH = BH^2 \rightarrow 5 \times 14 = 11^2 \quad \therefore f$$

$$\frac{BC}{AB} = \frac{HC}{HB} = \frac{14}{11} = f$$



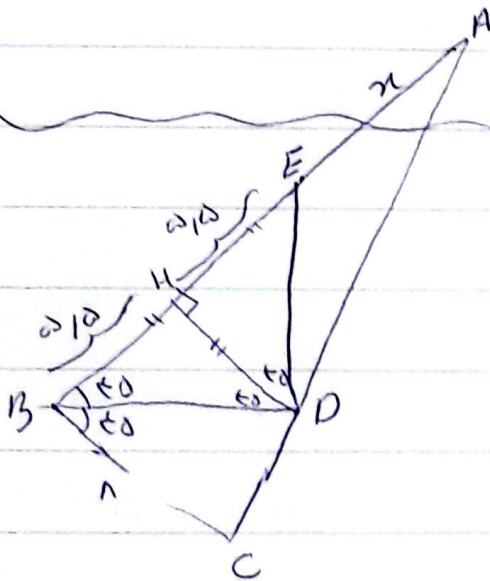
$$\triangle AFB, \triangle EFC = \quad \therefore \Delta$$

$$\frac{EC}{AF} = \frac{EF}{BF} = \frac{11}{EF+11} = \frac{EF}{4}$$

$$f \cdot 11 = FE^2 + 11FE \rightarrow FE^2 + 11FE - f \cdot 11$$

$$(FE + 11)(FE - f) \rightarrow FE = f$$

$$FE + AE = AF = 11$$

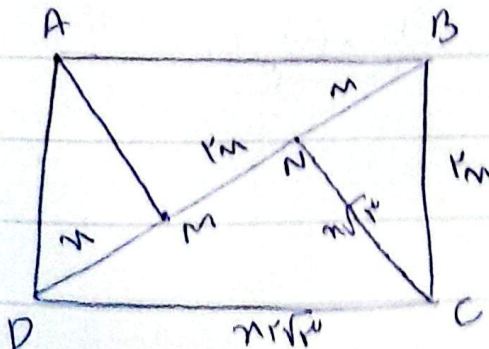


$$\frac{EH}{BH} = 1 \quad EH = BH = \frac{11}{f} = 11 \Delta = 4$$

$$\frac{n + 11 \Delta}{n + 11} = \frac{11 \Delta}{11}$$

$$11n + 11 \Delta = 11 \Delta n + 11 \Delta$$

$$11 \Delta = 11 \Delta n \rightarrow n = 4, 4$$



$$NBC, DBC \rightarrow \frac{BC}{DB}, \frac{NB}{BC} \quad \therefore v$$

$$14 \times f = f_m^2 + m^2 \rightarrow BC = m \sqrt{f}$$

$$(BC)^2 = f_m^2 \rightarrow BC^2 = f_m$$

$$\frac{\sqrt{r} n \times m}{r}$$

$$r m \sqrt{r}$$

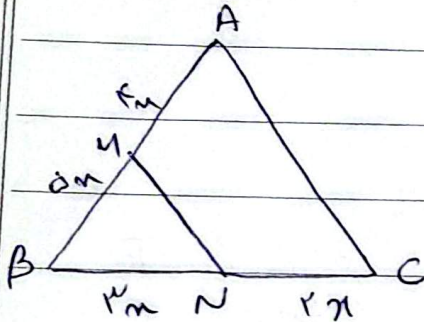
$$= \frac{m \sqrt{r}}{r}$$

$$r \sqrt{r} m^r$$

$$= \frac{1}{n}$$

$$\frac{1}{\sin}$$

$$= n$$



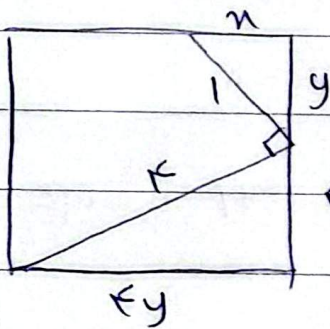
$$\frac{BN \times BM \times \frac{1}{r} \times \sin 13^\circ}{BC \times AB \times \frac{1}{r} \times \sin B}$$

$$= n$$

$$\frac{BM \times r m}{m n \times AB} = \frac{1}{r}$$

$$\rightarrow \frac{BM}{AB} = \frac{1}{r}$$

$$\frac{BM}{AM} = \frac{1}{r}$$



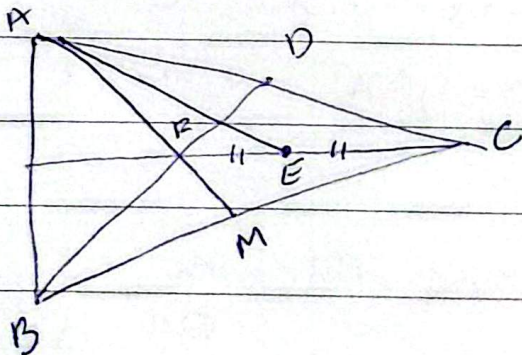
$$r m = r y$$

$$r y = r m + y \rightarrow r y = r m$$

$$\sqrt{a y^2 + 14 y^2} = 2 y = r$$

$$y = \frac{r}{a}$$

$$\left(r \times \frac{r}{a} \right)^2 = \frac{r a y}{r a}$$



$$AG = r GM = \frac{r}{r} AM$$

$$= 1$$

$$BD = r GP$$

$$FB = \frac{1}{r} GB$$

$$FD = \frac{1}{r} \times \left(\frac{1}{r} BD \right) = \frac{BD}{r} = a$$