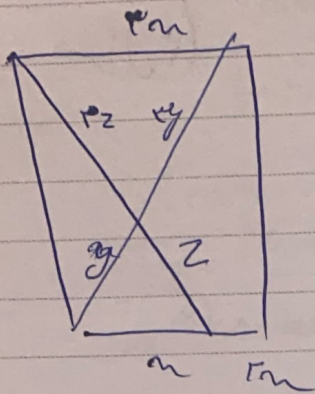




$$ED = rAE$$

سوال 1

$$\triangle EFC \sim \triangle AFE \quad \leftarrow \text{زاویه برابر}$$

~~AB~~

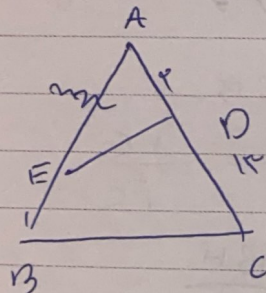
$$\frac{BC}{AE} = \frac{CF}{AF} = \frac{BF}{EF}$$

$$\frac{2m}{2} = r = \frac{CF}{AF} \rightarrow rAF = CF$$

$$BE^2 = (2m)^2 + m^2 = 5m^2 \quad \frac{2m}{2} = \frac{BF}{EF} = rEF = BF$$

$$BE = \sqrt{5}m = z = \sqrt{5} \cdot 2$$

$$\frac{FE}{AF} = \frac{z}{r} = \frac{\sqrt{5} \cdot 2}{r} \cdot \frac{r}{m\sqrt{5}} = \sqrt{\frac{1}{1}} = \frac{\sqrt{5}}{r}$$

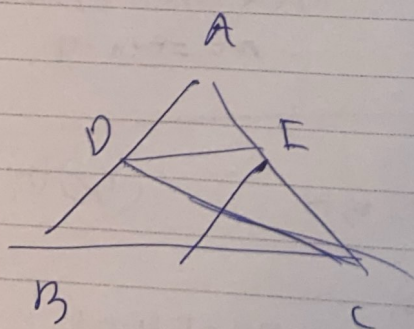


$$\triangle AED \sim \triangle ABC \rightarrow \begin{cases} \hat{E} = \hat{C} \\ \hat{A} = \hat{A} \end{cases} \rightarrow \begin{cases} \hat{B} = \hat{D} \end{cases} \quad (r) \text{ also}$$

$$\frac{AE}{AC} = \frac{AD}{AB} = \frac{ED}{BC} = \frac{r}{10} = \frac{r}{m+1}$$

$$m^2 + m = r \rightarrow m^2 + m - r = 0$$

$$(m+4)(m-1) = 0 \rightarrow \begin{cases} m = 1 \\ m = -4 \end{cases}$$



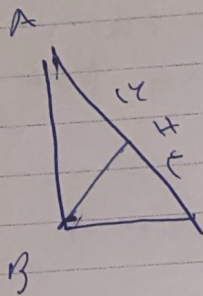
$$\frac{AD}{AB} = \frac{m}{2m} = \frac{DE}{FC+BF}$$

$$\frac{m}{2m} = \frac{1}{2} = \frac{DE}{FC+r} \rightarrow rDE = FC+r$$

$$DE = \frac{r}{2} = FC =$$

?

(سوال ۴)



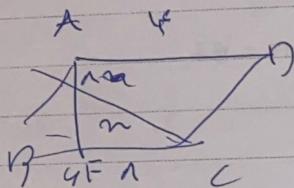
$$BC^2 = AC \times CH$$

$$\downarrow$$

$$\sqrt{5 \times 14} = 5\sqrt{8}$$

$$AB^2 = AC \times AH \rightarrow \sqrt{14 \times y} \rightarrow \sqrt{8}$$

$$\frac{5\sqrt{8}}{\sqrt{8}} = \frac{1}{y}$$



$$\angle A = \angle C = 90^\circ$$

$$\angle AEF = \angle CFH$$

$$\rightarrow \triangle AEF \sim \triangle CFH$$

$$\frac{BH}{BF} = \frac{CH}{AF} = \frac{BC}{AB} \rightarrow \frac{BH}{4} = \frac{CH}{m+n}$$

$$\angle C = 90^\circ$$

$$\angle F = \angle H = 90^\circ$$

$$\rightarrow \triangle EFC \sim \triangle HCB$$

$$\frac{BC}{EC} = \frac{BH}{FE} = \frac{HC}{FC}$$

$$\frac{\frac{BH}{4}}{\frac{BH}{m}} = \frac{\frac{CH}{m+n}}{\frac{CH}{n}} = \frac{m}{m+n} = \frac{n}{m+n}$$

$$m^2 + 14m = 14 \rightarrow m^2 + 14m - 14 = 0$$

$$(m+14)(m-1) \rightarrow m=1$$

$$AF = 5+1=6$$

$$B_1 = B_2$$

$$HD \parallel BC \rightarrow B_1 = D_1 \rightarrow D_1 = B_1 \rightarrow DH = BH$$

$$H = 90^\circ \rightarrow B_1 = D_1 = 90^\circ \rightarrow B_2 = 90^\circ$$

$$DEB \rightarrow EH \times BH = DH^2 \rightarrow BH = EH = \frac{11}{7}$$

$$HD \parallel BC \rightarrow \frac{m+11}{7} = \frac{11}{n} \rightarrow \frac{m+11}{7} = \frac{11}{n}$$

$$(m+11)n = 77 \rightarrow 4m+11n \rightarrow n=11$$

$$\frac{S_{ABCD}}{S_{BEM}} = \frac{AD \times DC}{\frac{1}{2} \times BH \times CH}$$

✓ 19/10

$$\frac{r_m \times \sqrt{r_m}}{\frac{1}{2} \times \sqrt{r_m} \times r_m} = 1$$

$$BC^2 = HC \times AC = BC \times C = r_m$$

(1) 19/10

$$\frac{AB}{MB} = \frac{9}{8}$$

$$\frac{BC \times AB \times \sin \beta}{BN \times MB \times \sin \beta} = 1$$

$$\frac{BM}{AB} = \frac{8}{9} \rightarrow \frac{BM}{AM} = \frac{8}{1}$$

$$\frac{DM \times AB}{r_m \times MB} = 1$$

$$\alpha + \beta + 90 = 180 \rightarrow \alpha + \beta = 90$$

(2) 19/10

$$\sin H B \rightarrow 90 + \alpha + M_1 = 180$$

$$M_1 = 90 - \alpha = \beta$$