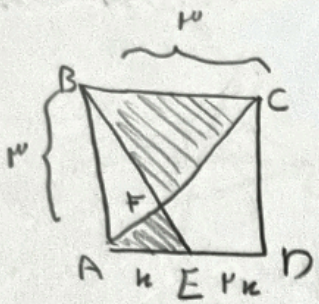
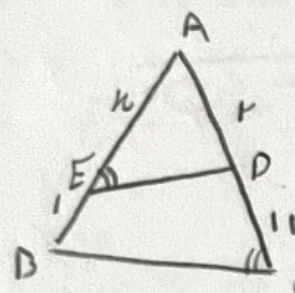




$\triangle BFC \sim \triangle AEF \rightarrow$ نسبت مشابه (دقیقه‌ای) $\rightarrow BE \cdot \sqrt{q+1} = \sqrt{10}$

$FE \cdot \frac{\sqrt{10}}{F}$

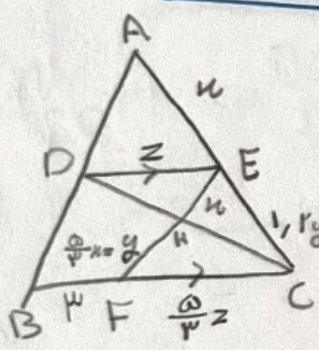
$AC \cdot \frac{\sqrt{10}}{2} \rightarrow AF \cdot \frac{\sqrt{10}}{2} = \frac{EF}{AF} \cdot \frac{\sqrt{10}}{2} \cdot \frac{\sqrt{10}}{2} = \frac{\sqrt{10}}{2}$



$\rightarrow A = A$
 E, C
 $C D, B$

$\rightarrow AED \sim ABC \rightarrow \frac{r}{k+1} = \frac{k}{10} \rightarrow k(k+1) = 10$

$k = 2$

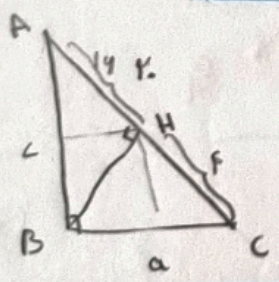


$\frac{r}{k+1} = \frac{k}{10} \rightarrow r = \frac{k}{10} (k+1)$

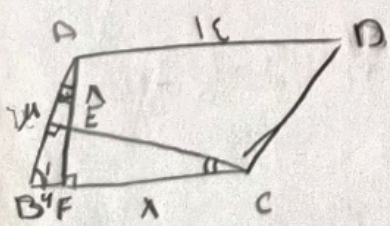
$DE \parallel BC \rightarrow DEH \sim HFC \rightarrow \frac{r}{k+1} \times \frac{1}{k} = r \rightarrow$

$\frac{r}{k+1} \times \frac{1}{k} = r \rightarrow \frac{r}{k+1} = r \times k \rightarrow \frac{1}{k+1} = k \rightarrow k^2 + k - 1 = 0$

$B \cdot \frac{1}{k} \times \frac{1}{k+1} + r = \frac{1}{k+1}$

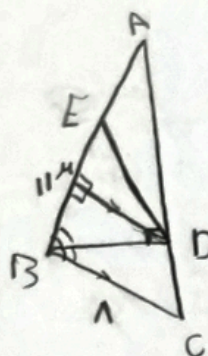


$\frac{a}{c} = \sqrt{\frac{k \times k}{k \times k}} = \frac{1}{r} \leq r$



$\triangle AEF \sim \triangle CDF \rightarrow \frac{k}{4} = \frac{1}{k+1} \rightarrow k^2 + k - 4 = 0$

$(k+1)(k-4) = 0 \rightarrow k = 4$

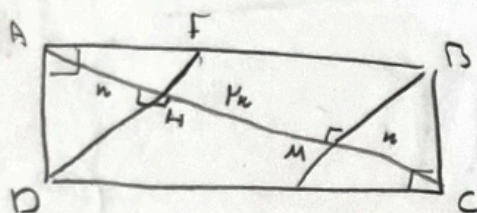


$$AM, HM < \frac{11}{r}$$

$$\frac{AM}{AB} = \frac{DM}{BC} \rightarrow \frac{k + \frac{11}{r}}{k + 11} = \frac{\frac{11}{r}}{11}$$

$$k = 4,4$$

5



$$k = 1$$

$$DH^2 = 1 \cdot r^2 = DH \cdot \sqrt{r}$$

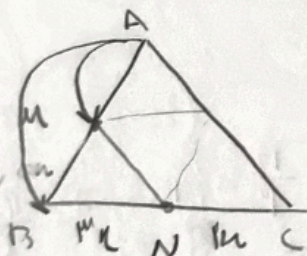
$$AD^2 = 1 + r^2 = AD \cdot r = BC$$

$$AB^2 = 14 - \varepsilon \rightarrow AB = r\sqrt{10} = DC$$

$$\frac{DH}{1+r} = \frac{DC}{AK} = \frac{BM}{DN} = \frac{\sqrt{10}}{1+k} = \frac{r\sqrt{10}}{DE} \Rightarrow HE = \frac{\sqrt{r}}{r}$$

$$\frac{1 \cdot \sqrt{r} \cdot k \cdot r}{\frac{1}{r} \cdot \sqrt{r} \cdot 1} = \sqrt{11}$$

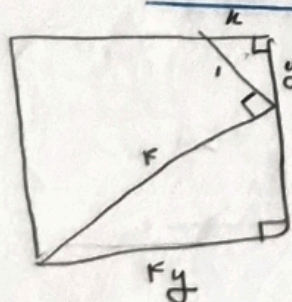
5



$$DN = \frac{r}{r} NC$$

$$\frac{S_{BMN}}{S_{ABC}} = \frac{BM}{BA} \cdot \frac{BN}{BC} \rightarrow \frac{1}{r} = \left(\frac{BM}{BA} \right) \times \frac{r}{\phi}$$

$$BC = BA \quad \frac{AM}{BA} = 1 = \frac{\phi}{9} = \frac{\varepsilon}{9} \rightarrow \frac{BM}{AM} = \frac{\phi}{\varepsilon}$$



مربع

$$k + y + r = y + r$$

$$k + y + r = y + r \Rightarrow k = r$$

$$r_k$$

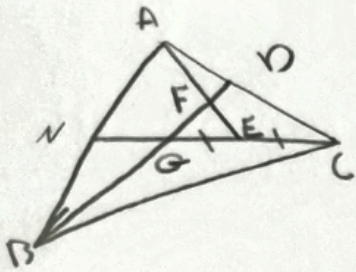
$$\frac{9}{14} y + y + r = 1$$

$$\frac{10}{14} y + 1 = y + \frac{14}{10} \Rightarrow y = \frac{14}{10} = \frac{7}{5} \Rightarrow k = \frac{10}{5}$$

$$r_y \times r_y = (r \times \frac{7}{5})^2 = (\frac{14}{5})^2 = (14/5)^2 = \sqrt{10/14}$$

(2)

5



$$AG : GN = \frac{2}{1} \Rightarrow AG = \frac{2}{3} AN$$

$$GN = \frac{1}{3} AN$$

$$GD = \frac{1}{3} BD \Rightarrow FD = \frac{1}{3} GD \Rightarrow ED = \frac{1}{9} BD \Rightarrow \frac{BD}{ED} = 9$$

9