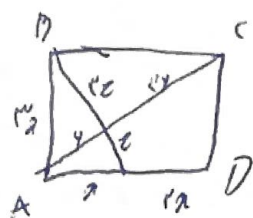


B₁ $\frac{r}{f}$ $\frac{p}{q}$

برهان هندسی



$$AC = 2\sqrt{r} \cdot a \Rightarrow y = \frac{\sqrt{r}}{f} a$$

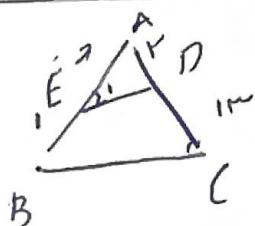
$$BC \parallel AE \Rightarrow \triangle BFC \sim \triangle AFE$$

$$\frac{EF}{BF} = \frac{AE}{BC} = \frac{AF}{FC} = \frac{1}{f}$$

$$BE = \sqrt{a^2 + r^2} = \sqrt{f} \cdot a$$

$$fz = \sqrt{f} \cdot a = z = \frac{\sqrt{f}}{f} a$$

$$\Rightarrow \frac{EF}{AF} = \frac{z}{y} = \frac{\frac{\sqrt{f}}{f} a}{\frac{\sqrt{r}}{f} a} = \frac{\sqrt{f}}{\sqrt{r}} = \frac{\sqrt{f}}{r}$$

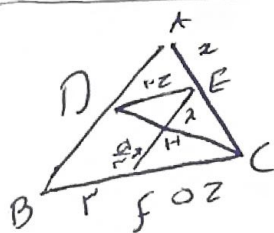


$$\hat{A} = \hat{A} \quad \hat{E} = \hat{C} \quad \Rightarrow \triangle AED \sim \triangle ABC$$

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

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

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



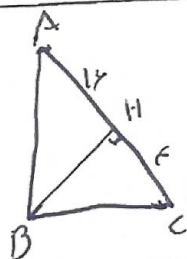
$$r = a$$

$$DE \parallel BC \Rightarrow \frac{r}{a} = \frac{r}{a}$$

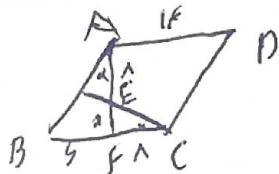
$$DE \parallel BC \Rightarrow \triangle ADE \sim \triangle ABC$$

$$\frac{DE}{BC} = \frac{r}{a} = \frac{r}{a}$$

$$fz = r \quad \frac{r}{a} = \frac{r}{a}$$



$$\frac{BC}{AB} = \frac{f}{a} \quad \frac{BC}{AB} = \frac{f}{a} \quad \Rightarrow \frac{AB}{BC} = \frac{f}{a}$$

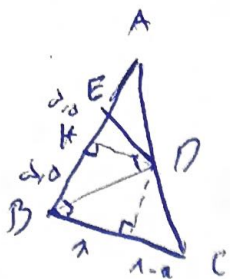


$$\frac{r}{a} = \frac{r}{a} = \frac{r}{a}$$

$$Af = a + f = \frac{r}{a}$$

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

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



$$\text{نقطه } BD \rightarrow HD = PH' = A$$

$$x^2 = a(11-a)$$

$$13^2 = 11a$$

$$P_0(2, 11)$$

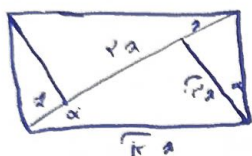
اگر $6 \leq x$
 اگر $x < 6$

$$\frac{\omega \cdot \omega}{HD \parallel BC} = \frac{y + d, d}{11 + y} = \frac{d \cdot d}{1}$$

$$11 + y + FF = y + d + d + y$$

$$y + y = 11 + d$$

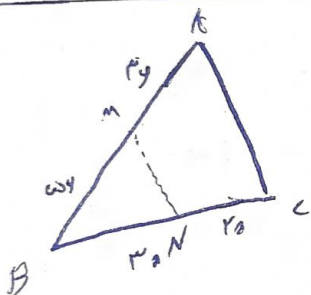
$$(y = 4.5)$$



$$y = ra$$

$$\frac{S_{\text{مستطیل}}}{S_{\text{مثلث قائم‌الزاویه}}} = \frac{\frac{1}{2} \times 2 \times 2}{\frac{1}{2} \times 2 \times 2} = 1$$

$$\sin \alpha = \frac{y}{r} = \frac{2}{y} \rightarrow y = ra$$

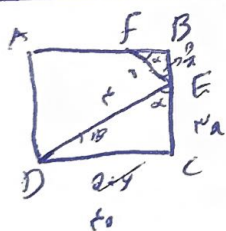


$$\frac{S_{\triangle ABC}}{S_{\triangle BMN}} = \frac{\frac{1}{2} \sin B \times AB \times BC}{\frac{1}{2} \sin B \times BM \times BN} = r$$

$$\frac{AB}{BM} = \frac{9}{5}$$

$$\frac{AB - BM}{BM} = \frac{r}{5}$$

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

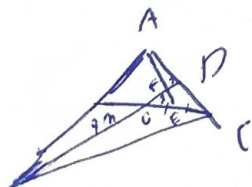


$$\alpha = \alpha \Rightarrow \triangle FBE \sim \triangle PEC$$

$$\frac{F}{1} = \frac{m+y}{n}$$

$$F_n = n + y \Rightarrow r_n = y$$

$$P_E^A C = d = f \xrightarrow{\text{مردود}} F_n = r_n \rightarrow S_{\text{مردود}} = (r_n)^r = (10, r_n)$$



$$AE, FD \rightarrow \text{مردود} \rightarrow f D = a \quad Gf = ra$$

$$GD = ra$$

$$BG = ya$$

$$\frac{BD}{FD} = \frac{9}{a} = 9$$