

Question 10  
 $ED = rEA$   
 $EF = ? AF$

$$\triangle AEF \sim \triangle BFC$$

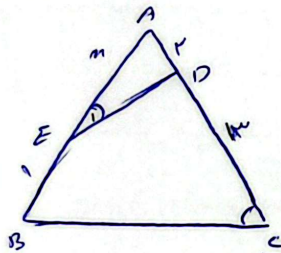
$$\frac{BC}{AE} = \frac{FC}{AF} = \frac{BE}{FE} \rightarrow r = \frac{h_1}{k_1} = \frac{BF}{EF}$$

$$\begin{aligned} BC \parallel AD & \Rightarrow \hat{B}_1 = \hat{A}_1 \\ \hat{A}_1 + \hat{C}_1 &= 90^\circ \\ \hat{A}_1 + \hat{B}_1 + \hat{B}_2 &= 90^\circ \end{aligned} \quad \left\{ \begin{aligned} \hat{C}_1 &= \hat{B}_2 \\ \hat{A}_1 &= \hat{E} \end{aligned} \right.$$

-1

$$\hat{AED} = \hat{ACB}$$

$$n = ?$$



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

$$\frac{AD}{AB} = \frac{AE}{AC} = \frac{n}{n+1} = \frac{m}{m+n} \rightarrow \frac{n}{n+1} = \frac{m}{m+n} \rightarrow n = m$$

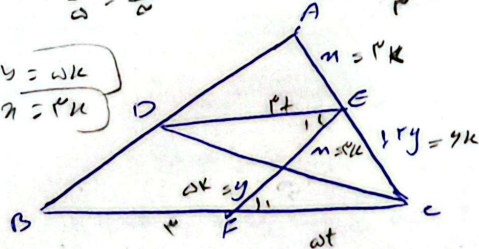
-4

$$DE \parallel BC$$

$$\begin{aligned} v_y &= \omega r \\ y &= \frac{\omega}{r} r \end{aligned}$$

$$\frac{y}{\omega} = \frac{r}{\omega} = k$$

$$\begin{aligned} y &= \omega k \\ r &= rk \end{aligned}$$



$$BF = r$$

$$BC = ?$$

-4

$$\frac{rt}{r+wt} = \frac{rk}{rk+yk} \rightarrow \frac{1}{2}$$

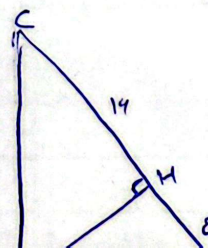
$$rt = r + wt \rightarrow t = \frac{r}{\omega} = \frac{r}{v\omega}$$

$$BC = r + \omega t = \frac{r}{v\omega} \cdot \omega = \frac{r}{v}$$

$$BC = r_0$$

$$HBSE$$

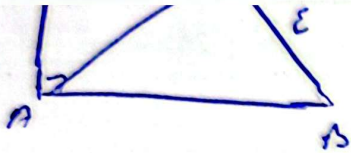
$$AB, AC = ?$$



$$AB^2 = BH \times CB \Rightarrow AB^2 = E \times r_0 = \sqrt{r_0} \times \sqrt{r_0} = AB$$

$$AC^2 = CH \times CB \Rightarrow AC^2 = 4 \times r_0 = 4r_0 \rightarrow AC = 2\sqrt{r_0}$$

-4



$$AE = m$$

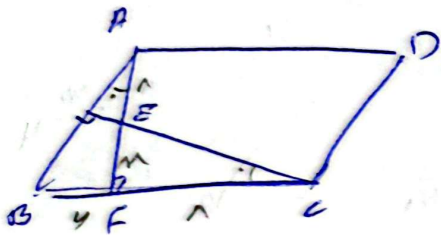
$$BF = 4$$

$$AD = 17$$

$$AB = ?$$

*Given*

-2



$$\hat{B} + \hat{C} = \hat{A}$$

$$\hat{A} + \hat{B} = \hat{C}$$

$$\left\{ \begin{array}{l} \hat{C} = \hat{A} \\ \hat{E} = \hat{F} = 90^\circ \end{array} \right.$$

$$\left\{ \begin{array}{l} \triangle ABF \sim \triangle EFC \end{array} \right.$$

$$\frac{FC}{AF} = \frac{EF}{BF} \Rightarrow \frac{17}{m+4} = \frac{4}{4} \Rightarrow m^2 + 17m - 68 = 0$$

$$\Rightarrow (m+17)(m-4) = 0 \rightarrow \begin{array}{l} m = -17 \text{ (GUESS)} \\ m = 4 \rightarrow AB = 17 + 4 = 21 \end{array}$$

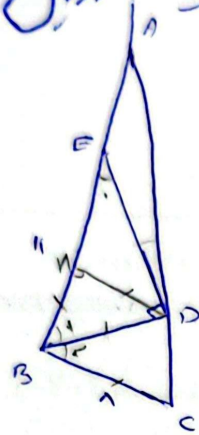
حل المسألة

AE = ?

BC = 10, DE = 4, BD = 6

AB = 10

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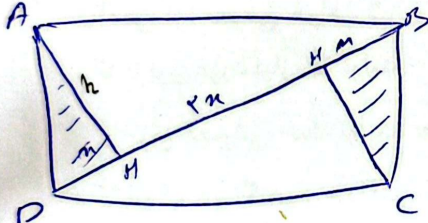


$$\left. \begin{array}{l} \hat{A}_1 + \hat{B}_1 = \hat{A} \\ \hat{E}_1 + \hat{B}_1 = \hat{A} \end{array} \right\} \hat{B}_1 = \hat{E}_1 \rightarrow \hat{A}_1 = \hat{B}_1 = \hat{E}_1$$

EDB مثلث قائم الزاوية → DH = ...

→ BH = 11/2 → AND ~ ABC → AN = 11/2

11/2 AN + 11/2 = AN → 11/2 AN = 11/2 → AN = 11/2 → AE = 11/2 - 11/2 = 4.4

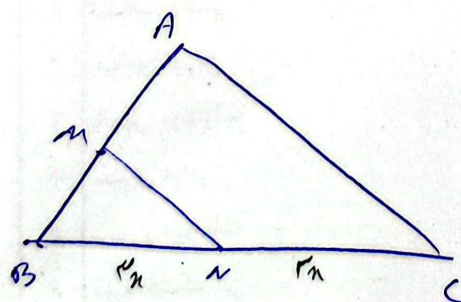


h^2 = m \times n \Rightarrow h = \sqrt{mn}

مساحة = 1/2 \times \text{طول} \times \text{عرض} = 1/2 \times h \times \sqrt{mn} = 1/2 \times \sqrt{mn} \times \sqrt{mn} = 1/2 \times mn

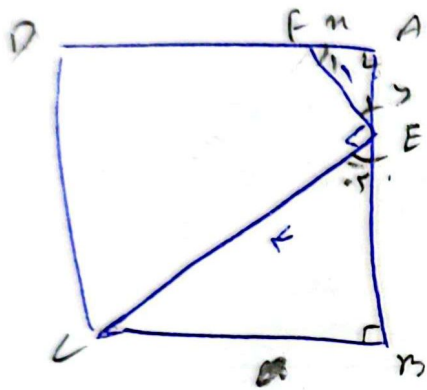
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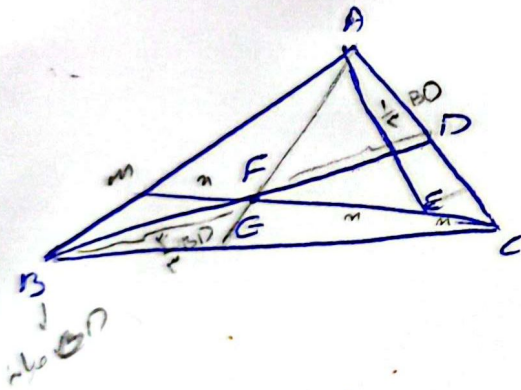


S\_{BMN} / S\_{ABC} = (BM \times BN) / (BA \times BC) = (BM / BA) \times (BN / BC) = 1/4 \Rightarrow BM / BA = 1/2

BM / BA = 1/2 = 1/2



$$GE = EC$$



نکته: در

$$\left. \begin{array}{l} \angle FAE = \angle ECF \\ \angle AEF = \angle ECF \end{array} \right\} \Rightarrow \angle FAE = \angle ECF \rightarrow \triangle AEF \sim \triangle CEF$$

$$\frac{m}{a-m} = \frac{y}{a} = \frac{1}{k} \Rightarrow y = \frac{a}{k} \quad m = \frac{ka}{1+k} \Rightarrow m + y = 1 \quad a = \frac{1}{0} = \frac{1}{k}$$

$$\frac{a}{1+k} + \frac{a}{k} = \frac{a}{1+k} = 1$$

$$\frac{BD}{FD} = ?$$

در مثل BCD، نقطه E بر روی BC و نقطه F بر روی CD قرار دارد. خطی از B که از E و F می‌گذرد، در نقطه G با خطی از C که از E و F می‌گذرد، تقاطع می‌کند. - 10

$$\frac{r}{m} = \frac{r}{n} \rightarrow m = n$$

$$FD = \frac{1}{k} BD \rightarrow \frac{BD}{\frac{1}{k} BD} = k$$