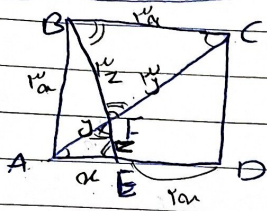


تکلیف ۱۱۰

مسئله ۱۱۰ (نقطه)



$ED = 1 - AE$

$\frac{EF}{AF} = ?$

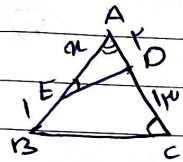
$\frac{EF}{AF} = \frac{\sqrt{1-x^2}}{x} = \frac{\sqrt{1-x^2}}{x}$ (1)

$AC = \sqrt{1^2 + 1^2} = \sqrt{2}$

$BE = \sqrt{1^2 + x^2} = \sqrt{1+x^2}$

$EF = 2 \rightarrow 2 + x = 1 + x$
 $x = 1 \rightarrow 1 + 1 = 2$
 $x = 1 \rightarrow 1 + 1 = 2$

$AFE \sim CFB \Rightarrow \frac{AF}{EF} = \frac{FE}{FB} = \frac{AE}{BC} = \frac{x}{1} = x$



$\hat{AED} = \hat{ACB} \quad m = ?$

$ADE \sim ABC$

$\frac{y}{x} = \frac{1+x}{1}$

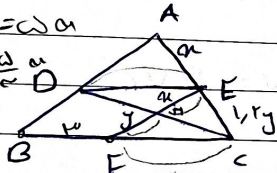
$(1+x)m = 1 \rightarrow x + m = 1 \rightarrow m = 1 - x$
 $(m+x)(m-x) = 0$
 $m = 1 - x$

$m = 1$

(2)

$w_y = \omega x$

$y = \frac{\omega}{x}$



$BC = ? \quad BF = ?$

$w_y = \omega x$

$DE \parallel BC$

(3)

$BE \parallel BC$

$\frac{PE}{BC} = \frac{AE}{AC}$

$\frac{PE}{BC} = \frac{AE}{AC} \rightarrow \frac{m}{1+x+y} = \frac{DE}{1+y}$

$\frac{m}{1+x+y} = \frac{DE}{1+y}$

$\frac{m}{1+x+y} = \frac{DE}{1+y}$

$DE \parallel FC \rightarrow \frac{PE}{FC} = \frac{EH}{HF} = \frac{m}{y} = \frac{1}{x}$

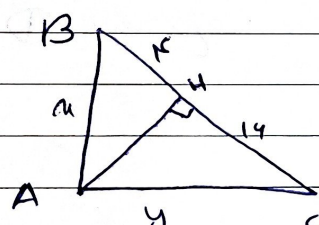
$m + FC = 1 \rightarrow FC = 1 - m$

$\omega DE = y FC$

$m + FC = 1 \rightarrow FC = 1 - m$

$FC = 1 - m$

$BC = BF + FC = 1 + 1 = 2$



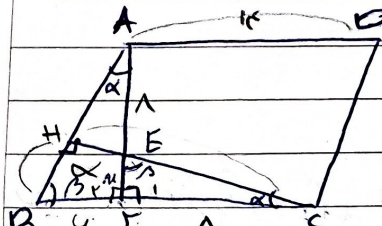
$m = \sqrt{1-x^2} = \sqrt{1-x^2}$

$\frac{y}{m} = 1 \quad \frac{m}{y} = 1$

(4)

$y = \sqrt{1-x^2} = \sqrt{1-x^2}$

(5)



$P = AF$

$AE = 1$

$BF = 1$

$AD = 1$

(6)

$F_1 = F_2 = 9$

$\hat{ABF} = \hat{FEC}$

$\Rightarrow ABF \sim FEC$

$\frac{AE}{CE} = \frac{BF}{EF}$

$m + 1 = 1$

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

$AF = m + AE = 1 + 1 = 2$

$(m+1)(m-1) = 0$

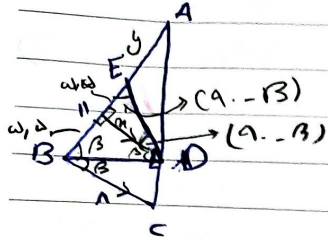
$m = 1$

$m = 1$

(7)

$\frac{AH}{CE} = \frac{AE}{EC} = \frac{1+E}{EF}$

② BD نیمه است؛ BDE (مثلث قائم) BE وتر است BC وتر AE و BD



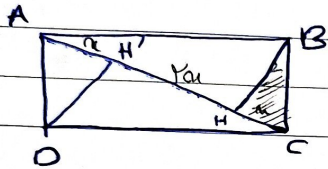
$$(a-b) + (a-b) = b+b = c \Rightarrow b = c$$

$$a^2 = a \times a \rightarrow a = a$$

⑤

$$\frac{y+2y}{y+11} = \frac{y/5}{1} \rightarrow 14y+11 = 11y+11$$

$$3y = 0 \rightarrow y = \frac{0}{3} = 0$$



$$S_{\triangle BHC} = \frac{a \times BH}{2}$$

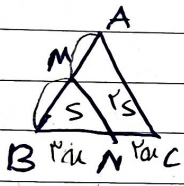
$$S_{\triangle ABC} = \frac{BH \times AC}{2}$$

⑥

$$S_{\triangle ABC} = S_{\triangle BHC} + S_{\triangle AHC} = BH \times AC$$

⑦

$$\frac{S_{\triangle ABC}}{S_{\triangle BHC}} = \frac{BH \times AC}{\frac{a \times BH}{2}} = \frac{2AC}{a} = 1$$



$$\frac{BM}{AM} = ?$$

$$S_{\triangle ABC} = 3 \times S_{\triangle BGC}$$

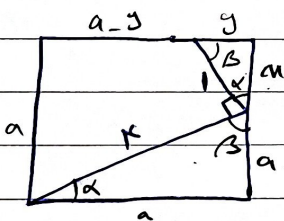
$$\frac{BM}{AM} = \frac{CN}{AN} = \frac{CP}{AP}$$

⑧

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

$$\Rightarrow \frac{AB}{BM} = \frac{4}{a} - \frac{BM}{AB} = \frac{a}{a}$$

$$\frac{BM}{AB-BM} = \frac{a}{a-a} = \frac{a}{a} = 1 \times a$$



$$\triangle DEC \sim \triangle EDA \rightarrow \frac{DE}{EB} = \frac{EC}{AB} = \frac{DE}{EA}$$

⑨

$$\frac{y}{a-m} = \frac{m}{a} = \frac{1}{c} \rightarrow a = cm$$

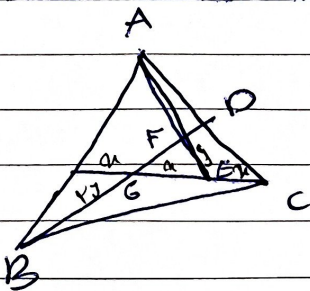
$$\frac{a-m}{a} = \frac{c}{a} \rightarrow a = m+cy$$

$$\left. \begin{aligned} cm &= m+cy \\ \frac{cm}{a} &= \frac{c}{a} \end{aligned} \right\}$$

$$ABE \rightarrow 14 = a^2 + (a-m)^2$$

$$\xrightarrow{a=cm} 14 = 14m^2 + 9m^2 = 25m^2 \rightarrow a = \frac{c}{5} \rightarrow a = \frac{14}{5}$$

$$S = \frac{a^2}{2} = \frac{14 \times 14}{2 \times 5} = \frac{98}{5} = 19.6$$



⑩ B مرکز ثقل است؛ GE = EC و BE = 3GE

FD = 1/3 y و GE = 1/3 y

⑪

$$\triangle AGC \Rightarrow AE, GE = 1/3 y$$

$$GE = \frac{1}{3} y \quad FD = \frac{1}{3} y$$

$$\frac{BD}{FD} = \frac{3y}{\frac{1}{3}y} = 9$$