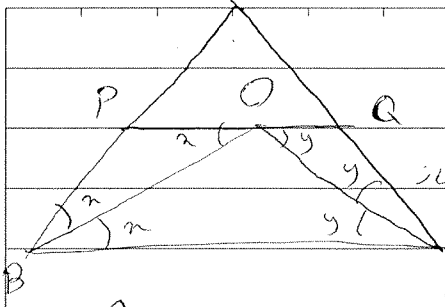


Subject:

Date:



$\hat{P}OB = x$ 1

$PQ \parallel BC \xrightarrow{\text{موازی و متوازی}} \hat{POB} = \hat{OBC} = x$

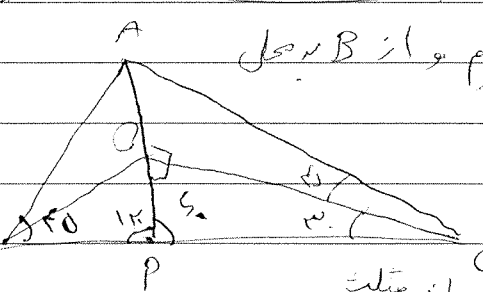
$\hat{OBC} = \hat{PBO} = x$

$\hat{PBO} = \hat{POB} \Rightarrow PO = PB$

$\hat{QOC} = y \quad PQ \parallel BC \xrightarrow{\text{موازی و متوازی}} \hat{QOC} = \hat{OCB} = y$
 $\hat{OCB} = \hat{OCQ} = y$

$\Rightarrow OQ = OC \quad AB + AC = AP + PB + AQ + QC = 12$

$\Rightarrow AP + PO + OQ + AQ = 12 = \hat{APQ}$ *مساوی مثلث*



2- از رأس هر دو رأس B و C خط عمود رسم می کنیم و از B به خط عمود از A

برخورد AP و خط عمود رسم می کنیم (O)

$\hat{COP} = 90, \hat{OPC} = 50 \xrightarrow{\text{مجموع زوایای داخلی مثلث}} \hat{OCP} = 40 \Rightarrow OP = PC$

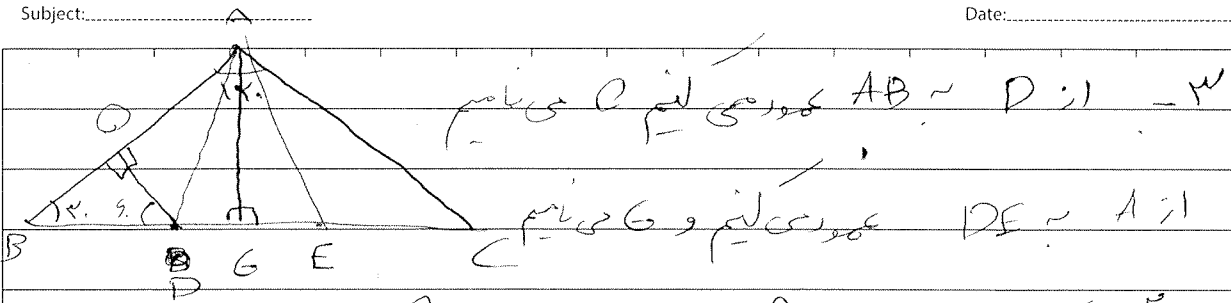
$\hat{OP} = BP \quad BP = \frac{PC}{2}$

$\hat{APB} = 120 \Rightarrow \hat{OBP} = 20 = \hat{POB}$ *مساوی مثلث*
 $\hat{OCP} = 30 \Rightarrow OB = OC$

$\hat{OBP} = 20 \Rightarrow \hat{ABO} = 10$

$\hat{ABP} = 40, \hat{APB} = 120 \xrightarrow{\text{مجموع زوایای داخلی مثلث}} \hat{BAP} = 10 \Rightarrow AO = OB$

$AO = OC \Rightarrow \hat{OAC} = 40 \Rightarrow \hat{ACP} = 40 + 20 = 60$
 $\hat{AOC} = 90 \Rightarrow \hat{ACO} = 40$



۳- از $D \sim AB$ که در میانه O می نامیم

از $A \sim DE$ که در میانه G می نامیم

$AB = AC, \hat{BAC} = 120^\circ \Rightarrow \hat{ABC} = \hat{ACB} = 30^\circ$

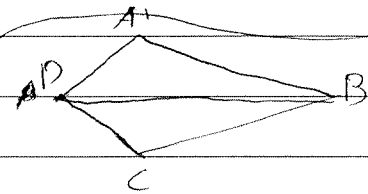
$\rightarrow OD = \frac{BP}{2} \quad \left. \begin{matrix} AC = AB \\ EC = BD \\ \hat{ABD} = \hat{ACE} \end{matrix} \right\} \xrightarrow{\text{قضی زنی}} \triangle AEC = \triangle ABD$

$\rightarrow AE = AD \Rightarrow \hat{ADE}$ متساوی الساقین (المنه یا حال) $\Rightarrow AG =$ میانه ارتفاع $\Rightarrow DG = \frac{DE}{2}$

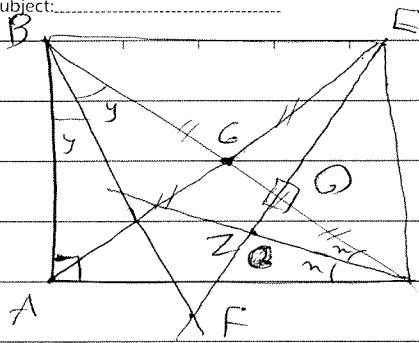
$DG = \frac{DE}{2}$

$\left. \begin{matrix} OD = \frac{BD}{2} \\ BD = DE \end{matrix} \right\} \Rightarrow OD = DG$
 $\left. \begin{matrix} AG = \text{میدان} \\ \hat{AOD} = \hat{AGD} \\ \hat{ODG} = \hat{GDA} \end{matrix} \right\} \Rightarrow \hat{ODG} = \hat{GDA} = 90^\circ$

$\rightarrow \hat{ADG} = 90^\circ$
 $ADG \text{ و } AEG \text{ در } AE = AD \Rightarrow \hat{ADG} = \hat{AEG} = 90^\circ \Rightarrow \hat{DAE} = 90^\circ$



۴- فقط اولیه درست است - مثال



$$\widehat{FOB} = 90^\circ, \widehat{BEF} = y \quad \text{--- } \omega$$

$$\rightarrow \widehat{BFO} = 90^\circ - y$$

$$\widehat{ABC} = 2y \Rightarrow \widehat{BCA} = 90^\circ - 2y$$

$$\left. \begin{array}{l} BG = GC \\ AG = GE \\ \widehat{AGC} = \widehat{BGE} \end{array} \right\} \begin{array}{l} \text{مضامین} \\ \text{افزای متساوی} \end{array} \Rightarrow \widehat{BCA} = 90^\circ - 2y$$

$$\widehat{EBG} = 90^\circ - 2y$$

$$\widehat{EBF} = \widehat{EBG} + \widehat{GBF} = 90^\circ - 2y + y = 90^\circ - y = \widehat{BFO}$$

$$\rightarrow \widehat{EBF} = \widehat{BFO} \Rightarrow \widehat{EBF} = \widehat{EFB} \Rightarrow BE = EF$$

$$\widehat{CBA} = 90^\circ - 2\alpha$$

$$\left. \begin{array}{l} BG = GC \\ AG = GE \\ \widehat{BGA} = \widehat{EGC} \end{array} \right\} \begin{array}{l} \text{مضامین} \\ \text{افزای متساوی} \end{array} \Rightarrow \widehat{CBA} = \widehat{ECG} = 90^\circ - 2\alpha$$

$$\left. \begin{array}{l} \widehat{EOC} = 90^\circ \\ \widehat{COZ} = \alpha \end{array} \right\} \Rightarrow \widehat{OZC} = 90^\circ - \alpha$$

$$\widehat{ECZ} = \widehat{OZC} + \widehat{ECG} = \alpha + 90^\circ - 2\alpha = 90^\circ - \alpha$$

$$\left. \begin{array}{l} \widehat{ECZ} = 90^\circ - \alpha \\ \widehat{OZC} = 90^\circ - \alpha \end{array} \right\} \Rightarrow \widehat{ECZ} = \widehat{OZC} \Rightarrow EC = EZ$$