

۱۹، ۷۵ آنین

دارد هم درجه - B

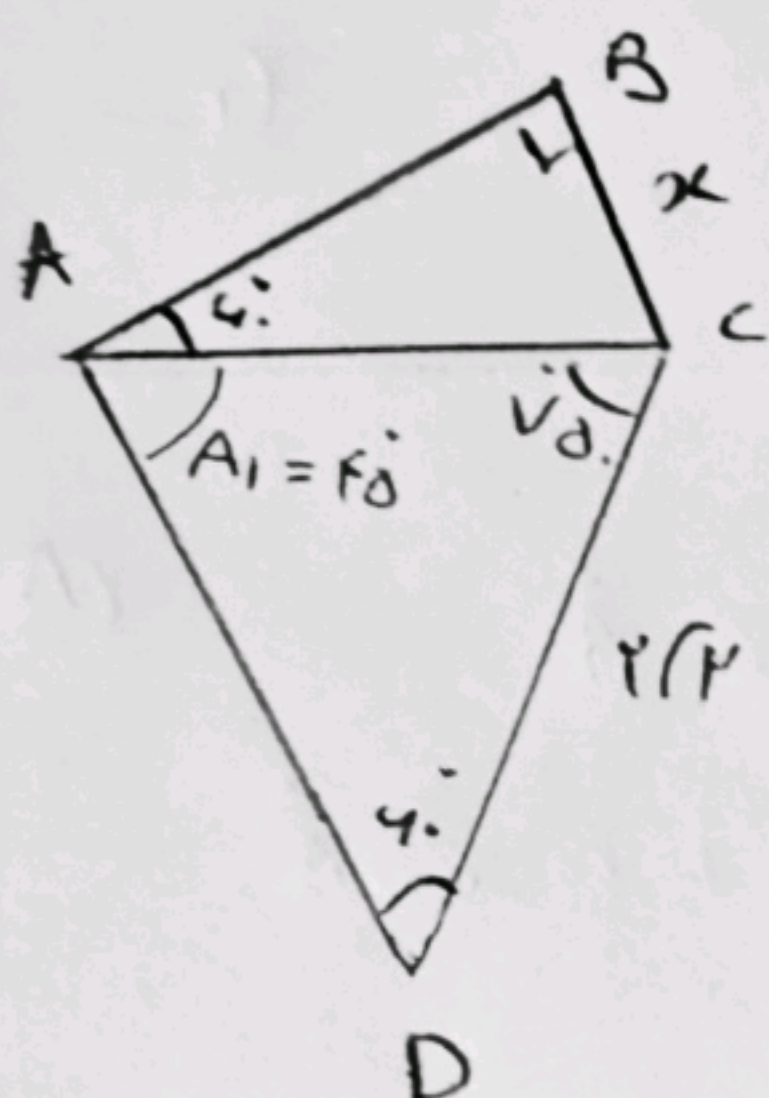
خوبه ای

قوسینوس ها $\frac{AC}{\sin \hat{B}} = \frac{BC}{\sin \hat{A}} \rightarrow \frac{1 \cdot \sqrt{4}}{3 \sin \hat{B}} = \frac{1 \cdot 2}{\sqrt{3}}$ (1)

$B+C=120 \Rightarrow A=60$

$\Rightarrow \sin \hat{B} = \frac{3\sqrt{2}}{4} = \frac{\sqrt{2}}{1} < \begin{matrix} \hat{B}=130^\circ \times \\ \hat{B}=50^\circ \checkmark \end{matrix} \Rightarrow \boxed{\hat{B}=50^\circ}$ (2)

$\hat{B} + \hat{C} = 120^\circ \Rightarrow \boxed{\hat{C} = 70^\circ}$



$\hat{A}_1 = 180 - (60 + 70) = 50^\circ$

قوسینوس ها ΔACD در مثل $\rightarrow \frac{2\sqrt{2} \times 1}{\sqrt{2}} = \frac{AC \times 1}{\sqrt{2}} \Rightarrow AC = 2\sqrt{2}$

ΔABC در مثل $\rightarrow \frac{1 \times 2}{\sqrt{3}} = \frac{x \sqrt{3}}{1} \Rightarrow \boxed{x=2}$

$(b^2 - 1) \cdot \frac{\sin \hat{C}}{\sin \hat{B}} = c$, $\frac{c}{\sin \hat{C}} = \frac{b}{\sin \hat{B}} \Rightarrow c = \frac{\sin \hat{C} \times b}{\sin \hat{B}}$ (3)

$\Rightarrow (b^2 - 1) \cdot \frac{\sin \hat{C}}{\sin \hat{B}} = \frac{\sin \hat{C}}{\sin \hat{B}} \times b \Rightarrow b^2 - b - 2 = 0 \rightarrow b = 2$
 $b = -1 \times$
 $b = 2 \checkmark$

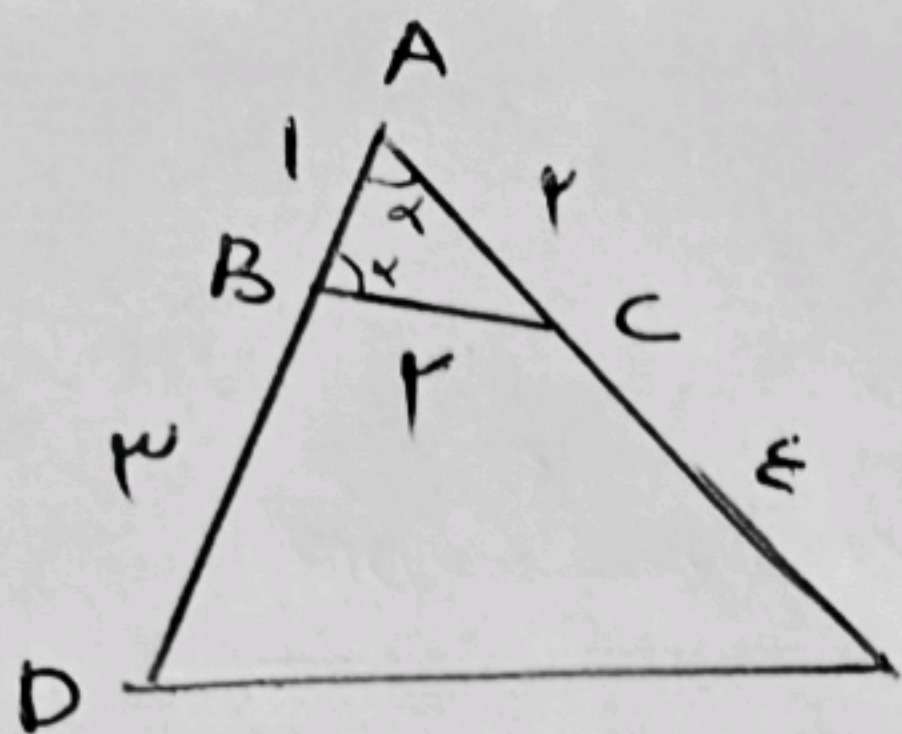
$AC^2 = AB^2 + BC^2 - 2 \times AB \times BC \times \cos \hat{B} \Rightarrow$ (4)

$149 = 1 + 4 + 4 - 2 \times 1 \times 2 \times \cos \hat{B} \Rightarrow \cos \hat{B} = \frac{1}{2}$

$\sin^2 + \cos^2 = 1 \rightarrow \sqrt{1 - \frac{1}{4}} = \frac{3}{4} = \sin \hat{B}$

قوسینوس ها $a^2 = 14 + 14 + 1 \times \sqrt{2} - 1 - 1 \times \sqrt{2} \Rightarrow \boxed{a = \sqrt{24}}$ (5)

قوسینوس ها $\frac{\sqrt{24} \times 1}{\sqrt{2}} = \frac{1}{\sin \hat{B}} \Rightarrow \sin \hat{B} = \frac{1}{\sqrt{2}} < \begin{matrix} \hat{B}=130^\circ \times \\ \hat{B}=50^\circ \checkmark \end{matrix} \Rightarrow \boxed{\hat{B}=50^\circ}$ (6)



$$\Delta ABC \text{ متساوی الساقین} \Rightarrow h = \frac{\sqrt{10}}{2} \quad (9)$$

$$\Rightarrow 1 \times 2 \times \frac{1}{2} \times \sin \hat{A} = \frac{1}{2} \times \frac{\sqrt{10}}{2} \times 1 \quad (10)$$

$$\Rightarrow \sin \hat{A} = \frac{\sqrt{10}}{4} \Rightarrow \hat{A} = \frac{1}{2}$$

بقیہ کے لیے $DE^2 = 1^2 + 2^2 - 2 \times 1 \times 2 \times \frac{1}{2} \Rightarrow DE = \sqrt{5} = 2\sqrt{1}$

$$BC^2 = 4 + 1 - 2 \times 1 \times 2 \times \frac{1}{2} \Rightarrow BC = 1 \quad (11)$$

$$S_{\Delta ABC} = \frac{1}{2} \times 1 \times 2 \times \frac{\sqrt{5}}{2} = \frac{1}{2} \sqrt{5} \quad (12)$$

$$\frac{(b+c)^2 - a^2}{bc(\cos \hat{A} + 1)} \Rightarrow a^2 = b^2 + c^2 - 2bc \cos \hat{A} \quad (13)$$

$$\Rightarrow b^2 + c^2 = a^2 + 2bc \cos \hat{A} \quad (14)$$

$$\Rightarrow \frac{b^2 + c^2 + 2bc - a^2}{bc \cos \hat{A} + bc} = \frac{2bc \cos \hat{A} + 2bc}{bc \cos \hat{A} + bc} = 2 \quad (15)$$

$$\frac{a^2 + b^2 - c^2}{a+b-c} = a^2 \Rightarrow a^2 + b^2 - c^2 = a^2 + a^2b - a^2c \quad (16)$$

$$\Rightarrow (b-c)(b^2 + bc + c^2) = a^2(b-c) \Rightarrow b^2 + bc + c^2 = a^2 \Rightarrow \cos \theta = -\frac{1}{2} \quad (17)$$

$$S_{\Delta ABC} = 1 = \frac{1}{2} \times \frac{1}{2} \times (1^2 - \cos \theta)(1 + 2 \cos \theta) \Rightarrow$$

$$1^2 \cos \theta - 1 \cos \theta + 1 = 0 \Rightarrow \cos \theta = \frac{1}{2} \times$$

دقت کن !!

$$\frac{a^2}{a+b-c} = a^2 \Rightarrow a^2 = (1^2 - \cos \theta)^2 + (1 + 2 \cos \theta)^2 - \frac{1}{2} \sqrt{5} \times (1^2 - \cos \theta)(1 + 2 \cos \theta)$$

$$\Rightarrow a^2 = 1 + 1 - (\sqrt{5} \times 1 \times 1) = 2 - \sqrt{5} = 1 - \sqrt{5} \quad (18)$$