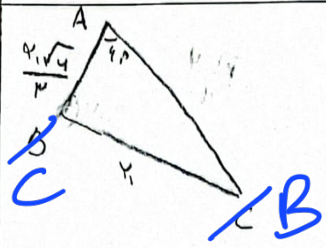


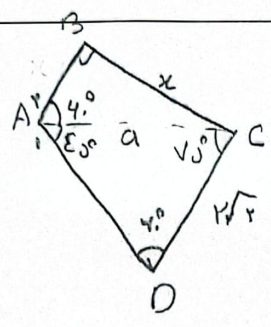
نام و نام خانوادگی: (پروین کبریا) پاسخنامه تشریحی تکلیف شماره ۳۰۰ کلاس: A



$$\frac{2}{\sin \hat{A}} = \frac{2\sqrt{4}}{\sin \hat{B}} \rightarrow \frac{2}{\frac{2}{\sqrt{10}}} = \frac{2\sqrt{4}}{\sin \hat{B}} \Rightarrow \sin \hat{C} = \frac{2}{2} = 1 \Rightarrow \hat{C} = 90^\circ$$

$$\hat{B} + \hat{C} = 14^\circ \Rightarrow \hat{B} = 90^\circ - 14^\circ = 76^\circ$$

(۲)



$$\hat{A}_1 = 180^\circ - \hat{C} - \hat{D} = 90^\circ$$

$$\frac{2\sqrt{2}}{\sin \hat{A}_1} = \frac{a}{\sin \hat{B}} \Rightarrow \frac{2\sqrt{2}}{\frac{1}{\sqrt{2}}} = \frac{a}{\frac{1}{\sqrt{2}}} \Rightarrow a = 2\sqrt{2}$$

$$\sin \hat{A}_2 = \frac{x}{a} \Rightarrow \frac{\sqrt{2}}{2} = \frac{x}{2\sqrt{2}} \Rightarrow x = 2$$

(۲)

$$\frac{a}{\sin \hat{A}} = \frac{b}{\sin \hat{B}} = \frac{c}{\sin \hat{C}} \Rightarrow \left. \begin{aligned} c \sin \hat{B} &= b \sin \hat{C} \quad (1) \\ (b^2 - 2) \sin \hat{C} &= \sin \hat{B} c \quad (2) \end{aligned} \right\} \Rightarrow b^2 - 2 = b \Rightarrow b^2 - b - 2 = 0$$

$$(b-2)(b+1) = 0 \Rightarrow b = 2 \text{ or } b = -1$$

(۲)

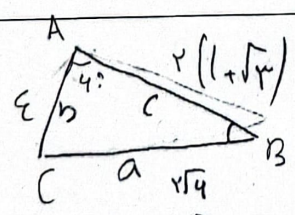
b = 2

$$P = \frac{2 + 2 + 2}{2} = 3$$

$$S_0 = \sqrt{P(P-a)(P-b)(P-c)} = \sqrt{3(3-2)(3-2)(3-2)} = \sqrt{3} = 1.5$$

$$S_0 = \frac{1}{2} AB \sin \hat{C} = \frac{1}{2} \times 2 \times 2 \times \sin 90^\circ = 2$$

(۲)



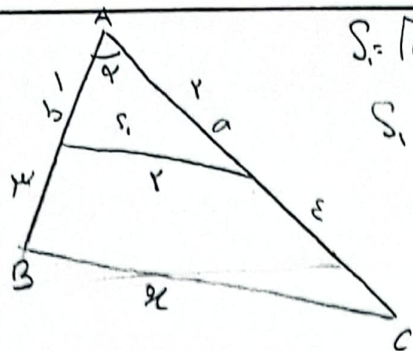
$$a^2 = b^2 + c^2 - 2bc \cos \hat{A} = b^2 + c^2 - bc$$

$$14 + 4 + 12 + 1\sqrt{2} = 1 + 1\sqrt{2}$$

$$\frac{2}{\sin \hat{B}} = \frac{2\sqrt{2}}{\sin \hat{A}} \Rightarrow \frac{2}{\sin \hat{B}} = \frac{2\sqrt{2}}{\frac{1}{\sqrt{2}}} \Rightarrow \sin \hat{B} = \frac{1}{2} \Rightarrow \hat{B} = 30^\circ$$

$$\hat{C} = 180^\circ - (45^\circ + 30^\circ) = 105^\circ$$

(۲)

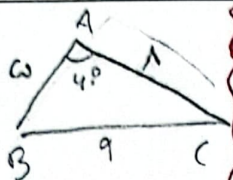
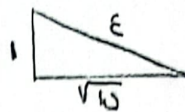


$$S_1 = \frac{1}{2} (p \cdot q \cdot r) = \frac{1}{2} \left(\frac{3}{4} \times \frac{1}{4} \times \frac{1}{4} \times \frac{16}{4} \right) = \frac{\sqrt{10}}{4}$$

$$S_1 = \frac{ab \sin \alpha}{2} \Rightarrow 1 \times 2 \times \frac{1}{2} \times \sin \alpha = \frac{\sqrt{10}}{4} \Rightarrow \sin \alpha = \frac{\sqrt{10}}{4} \Rightarrow \cos \alpha = \frac{1}{2}$$

$$x^2 = AB^2 + AC^2 - 2AB \cdot AC \cdot \cos \alpha$$

$$1^2 + 4^2 - 1^2 \Rightarrow x^2 = 16 \Rightarrow x = 4$$

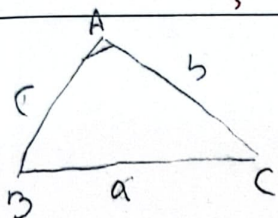


$$BC^2 = AB^2 + AC^2 - 2AB \cdot AC \cdot \cos \alpha, \quad 2^2 + 4^2 - 1^2 = 16 \Rightarrow BC = 4$$

$$\Rightarrow BC = 4$$

$$BC = \sqrt{16} = 4$$

$$S_2 = AB \times AC \times \sin \hat{A} \times \frac{1}{2} = 2 \times 4 \times \frac{1}{2} \times \frac{\sqrt{3}}{2} = 2\sqrt{3}$$



$$a^2 = b^2 + c^2 - 2bc \cos \hat{A} \quad \left(\frac{b+c}{2} \right)^2 = \frac{b^2 + c^2 + 2bc}{4} \quad \text{①}$$

$$= \frac{bc(1 + 2\cos \hat{A})}{bc(1 + \cos \hat{A})} = \frac{1 + 2\cos \hat{A}}{1 + \cos \hat{A}} = 2$$

$$2$$

$$\frac{(b-c)(b^2 + c^2 + bc) + a^3}{(b+a-c)} = \frac{a^2(b+a-c)}{(b+a-c)} = a^2$$

اثبت بازگشتی الجبري

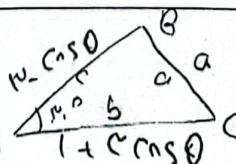
$$2$$

$$\cos \hat{A} = -\frac{1}{2} \Rightarrow \hat{A} = 120^\circ$$

$$S_{ABC} = \frac{1}{2} AB \cdot AC \cdot \sin \hat{A} \Rightarrow 2 = \frac{1}{2} \times \frac{1}{2} \times \frac{(1 - \cos \theta)(1 + \cos \theta)}{1 + \cos \theta} \Rightarrow 1 - \cos \theta + \cos \theta = 1 \Rightarrow \cos \theta = 1$$

$$\Rightarrow 1 - \cos \theta + \cos \theta + 1 = 1 \Rightarrow 1 - \cos \theta - \cos \theta + 1 = 1 \Rightarrow \cos \theta = 1$$

$$a^2 = AB^2 + AC^2 - 2AB \cdot AC \cdot \cos \hat{A} \Rightarrow a^2 = 1 + 4 - 2 \times 1 \times 2 \times \cos 120^\circ \Rightarrow a^2 = 1 + 4 - 2 \times (-1) = 7 \Rightarrow a = \sqrt{7}$$



$$2$$