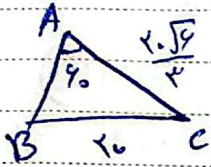


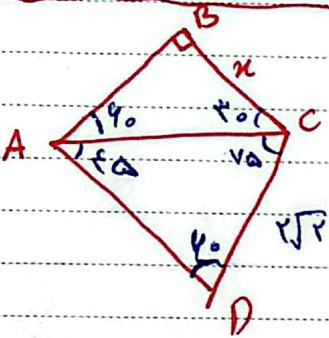
<< مری نرسجانی - تالیف ۱۳ >>



$$110 - 120 = 40 = \hat{A}$$

$$\Rightarrow \frac{a}{\sin A} = \frac{b}{\sin B} \Rightarrow \frac{10}{\frac{\sqrt{3}}{2}} = \frac{\frac{10\sqrt{2}}{2}}{\sin B} \Rightarrow \sin B = \frac{\sqrt{2}}{2} \quad (1)$$

$$\Rightarrow \hat{B} = 45^\circ \Rightarrow \hat{B} + \hat{C} = 120 \Rightarrow 45 + \hat{C} = 120 \Rightarrow \hat{C} = 75^\circ$$



(2) زاویه ها را بدست می آوریم

$$\frac{a}{\sin A} = \frac{d}{\sin D} \Rightarrow \frac{2\sqrt{2}}{\frac{\sqrt{3}}{2}} = \frac{d}{1} = \frac{d}{\frac{\sqrt{3}}{2}} \Rightarrow d = AC = 2\sqrt{3}$$

$$x = \cos 40^\circ \times AC \Rightarrow x = \frac{\sqrt{3}}{2} \times 2\sqrt{3} = 3$$

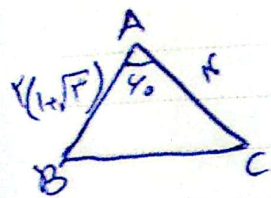
$$\frac{\sin C}{c} = \frac{\sin B}{b^2 - 2} \Rightarrow \frac{c}{\sin C} = \frac{b^2 - 2}{\sin B} \xrightarrow{\text{مربع میزنیم}} b^2 - 2 = b \quad (3)$$

$$\Rightarrow b^2 - b - 2 = 0 \Rightarrow b = \frac{-1 \pm \sqrt{1 + 8}}{2} \Rightarrow b = 2$$

$$b^2 = a^2 + c^2 - 2ac \cos B \Rightarrow 149 = 100 + 121 - 2 \times 10 \times 11 \times \cos B$$

$$\Rightarrow \cos B = 0.1 \Rightarrow B = 87^\circ$$

$$\Rightarrow \sin B = 0.9$$



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

Ⓐ

(الف)

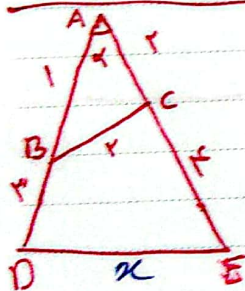
$$a^2 = \frac{1+1^2}{1^2} + 1 - 1 - 1 + \sqrt{2} = \sqrt{2} = a^2 \Rightarrow a = \sqrt{2}$$

$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C} \Rightarrow \frac{\sqrt{2}}{\frac{1}{\sqrt{2}}} = \frac{1}{\sin B} = \frac{1+\sqrt{2}}{\sin C}$$

Ⓑ

$$\sin B = \frac{\sqrt{2}}{1} \Rightarrow \hat{B} = 45^\circ \Rightarrow \hat{A} + \hat{B} + \hat{C} = 180^\circ$$

$$\Rightarrow \hat{C} = 90^\circ$$



$$1 = 1 + 1 - 2 \times 1 \times 1 \times \cos \alpha \Rightarrow \cos \alpha = \frac{1}{2}$$

$$\cos \alpha = \frac{1}{2}$$

$$\Rightarrow x^2 = 1^2 + 1^2 - 2 \times 1 \times 1 \times \frac{1}{2} \Rightarrow x^2 = 1 \Rightarrow x = 1$$

$$x = \sqrt{10}$$

⒱

$$\text{الف) } BC = x \Rightarrow x^2 = 1^2 + 9 - 2 \times 1 \times 3 \times \frac{1}{2} \Rightarrow x^2 = 7 \Rightarrow x = \sqrt{7}$$

$$\text{ب) } \frac{1}{2} \times b \times c \times \sin A = \frac{1}{2} \times 1 \times 1 \times \frac{1}{\sqrt{2}} = \frac{1}{2\sqrt{2}} = S_{ABC}$$

$$\Rightarrow x = \sqrt{10}$$

$$\frac{b^r + c^r + \cancel{rbc} - \overbrace{a^r}^{b^r + c^r - 2bc \cos A}}{bc(\cos A + 1)} = \frac{\cancel{b} + \cancel{c} + \cancel{rbc} - \cancel{b} - \cancel{c} + \cancel{rbc} \cos A}{bc(\cos A + 1)}$$

①

$$\Rightarrow \frac{\cancel{rbc}(\cancel{1 + \cos A})}{\cancel{bc}(\cancel{\cos A + 1})} = r$$

$$\cancel{a} + b^r - c^r = \cancel{a} + a^r b - a^r c \Rightarrow b^r - c^r = a^r(b - c)$$

$$(\cancel{b - c})(b^r + c^r + bc) = a^r(\cancel{b - c}) \Rightarrow b^r + c^r + bc = b^r + c^r - 2bc \cos A$$

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

$$S = r = \frac{1}{r} (r^3 - \cos \theta)(1 + r^2 \cos \theta) \xrightarrow{\cos \theta = x} r = \frac{1}{x} (-r^3 x^r + 1x + r^3)$$

$$1 = -r^3 x^r + 1x + r^3 \Rightarrow -r^3 x^r + 1x - 0 = 0 \Rightarrow x = \cos \theta = \frac{1}{2}$$

$$a^r = b^r + c^r - 2bc \cos A \Rightarrow a^r = 19 + 17 - 2 \times 17 \times \frac{1}{2}$$

$$\underline{a^r = 19 - 17 = 2}$$