

$$\frac{a}{\sin A} = \frac{b}{\sin B} \rightarrow \frac{2\sqrt{2}}{\sin 40^\circ} = \frac{y}{\sin 40^\circ} \rightarrow y = 2\sqrt{2}$$

$$\frac{a}{\sin A} = \frac{b}{\sin B} \rightarrow \frac{x}{\frac{\sqrt{3}}{2}} = \frac{y}{\frac{\sqrt{3}}{2}} \rightarrow x = y = 2\sqrt{2}$$

$$\hat{B} + \hat{C} = 110^\circ$$

$$\hat{B} + \hat{C} + \hat{A} = 180^\circ \rightarrow \hat{A} = 30^\circ$$

$$\frac{a}{\sin A} = \frac{b}{\sin B} \rightarrow \frac{2}{\sin 30^\circ} = \frac{b}{\sin 110^\circ} \rightarrow \sin B = \frac{\sqrt{3} \times \sqrt{2}}{2}$$

$$\sin B = \frac{\sqrt{2}}{2} \rightarrow B = 45^\circ$$

$$b^2 = c^2 + a^2 - 2ac \cos B$$

$$13^2 = 10^2 + 14^2 - 2 \times 10 \times 14 \times \cos B$$

$$149 = 100 + 196 - 280 \cos B$$

$$+474 = +280 \cos B \rightarrow \frac{474}{280} = \cos B$$

$$\sin^2 B + \cos^2 B = 1 \rightarrow \frac{474}{280} + \sin^2 B = 1 \rightarrow \sin B = \frac{4}{10}$$

$$(b^2 - r) \frac{\sin C}{\sin B} = C$$

$$\frac{b^2 - r}{\sin B} = \frac{C}{\sin C}$$

$$b^2 - r = b$$

$$b^2 - b - r = 0 \rightarrow (b - r)(b + r) = 0$$

$$b = r$$

$$DE^2 = AD^2 + AE^2 - 2AD \times AE \cos \alpha$$

$$DE = \sqrt{14}$$

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

$$a^2 = 14^2 + 13^2 - 2 \times 14 \times 13 \times \cos A$$

$$a^2 = 14^2 + 13^2 - 2 \times 14 \times 13 \times \frac{1}{2}$$

$$a^2 = 14^2 + 13^2 - 182 = 14^2$$

$$a = 14$$

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

$$\frac{14^2}{\sqrt{3}} = \frac{r}{\sin B}$$

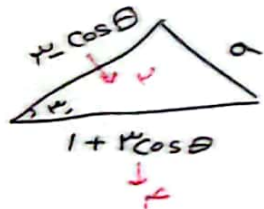
$$\sin B = \frac{r}{14}$$

$$B = 45^\circ$$

$$DE = \sqrt{12} \quad \leftarrow F_0 = 14 + 12 - 12$$

$$\frac{(b+c)^2 - a^2}{bc(\cos A + 1)} \xrightarrow{\text{قضیه کینوس}} \frac{b^2 + c^2 + 2bc - a^2}{bc(\cos A + 1)} \xrightarrow{\text{سوال ۸}} \frac{b^2 + c^2 - a^2 + 2ab \cos A}{bc(\cos A + 1)}$$

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



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

$$1 = 1 - \cos \theta + 2 \cos \theta + \cos^2 \theta$$

$$0 = -\cos \theta + 2 \cos \theta + \cos^2 \theta \xrightarrow{\text{درج دوم}} 0 = +1 \cos \theta + \cos^2 \theta$$

$$(\cos \theta + 1)(\cos \theta + 1)$$

$$\cos \theta = -1 \quad \text{یا} \quad \cos \theta = -\frac{1}{2} \quad \text{یا} \quad \cos \theta = \frac{1}{2}$$

$$\cos \theta = \frac{1}{2} \quad \text{یا} \quad \cos \theta = -\frac{1}{2} \quad \text{یا} \quad \cos \theta = -1$$

دقت کن !!

$$\cos \theta = -\frac{1}{2} \quad \text{یا} \quad \cos \theta = \frac{1}{2}$$

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

$$a^2 = b^2 + c^2 - 2bc \cos A \quad \leftarrow \frac{1}{2} \times 2 \times 2 \times \frac{1}{2} = 1 \quad \leftarrow F_0 + 14 - 1 = 12 \quad \checkmark$$

$$b^2 + c^2 - 2(2)(2)\left(\frac{1}{2}\right) = 12 - 4 = 8$$

$$a^2 = b^2 + c^2 - 2bc \cos A \quad \leftarrow a = \sqrt{12}$$

$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

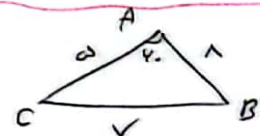
$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

$$\sin B = \frac{b}{a} = \frac{2}{\sqrt{12}} \quad \rightarrow \quad 135^\circ \quad \text{یا} \quad 45^\circ$$

$$B + A + C = 180^\circ$$

$$\rightarrow C = 45^\circ$$

$$\rightarrow A = 45^\circ \quad \checkmark$$



$$BC^2 = 2^2 + 2^2 - 2 \times 2 \times 2 \times \cos 90^\circ$$

$$BC^2 = 4 + 4 - 0 = 8 \quad \rightarrow \quad BC = \sqrt{8} = 2\sqrt{2}$$

$$\leftarrow S = \frac{1}{2} \times 2 \times 2 \times \sin 90^\circ$$

$$S = 1 \quad \checkmark$$

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

$$a^3 + b^3 - c^3 = a^3 + a^2b - a^2c$$

$$(b^3 - c^3) = a^2(b - c) \quad \leftarrow \text{فصل و تقسیم}$$

$$bc = -2bc \cos A \quad \rightarrow \quad \cos A = -\frac{1}{2}$$

$$\leftarrow \text{قضیه کینوس}$$