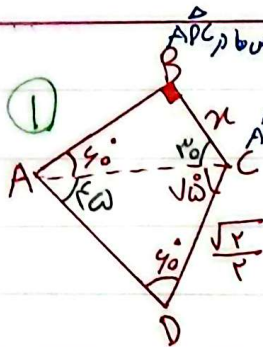


① $\frac{20\sqrt{6}}{\sin 45^\circ} = \frac{20}{\sin B} \Rightarrow \sin B = \frac{\sqrt{2}}{2}$

② $\sin B = \frac{\sqrt{2}}{2} \Rightarrow \hat{B} = 45^\circ \text{ یا } 135^\circ$, $\hat{C} = 45^\circ$

1



① $\frac{20\sqrt{6}}{\sin 135^\circ} = \frac{20}{\sin B} \Rightarrow \sin B = \frac{\sqrt{2}}{2}$

② $\frac{20\sqrt{6}}{\sin 135^\circ} = \frac{20}{\sin B} \Rightarrow \sin B = \frac{\sqrt{2}}{2}$

2

① $\frac{b^2 - r^2}{\sin \hat{B}} = \frac{c}{\sin \hat{C}} \Rightarrow \frac{b^2 - r^2}{\sin \hat{B}} = \frac{b}{\sin \hat{B}} \Rightarrow b^2 - r^2 = b$

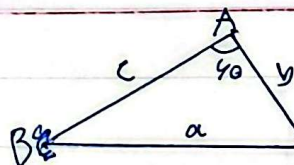
② $b^2 - b - r^2 = 0$

3

① $199 = f_{aa} + f_{f1} - 18f_{oc} \cos B \rightarrow 18f_{oc} \cos B = 9\sqrt{2} \Rightarrow \cos B = \frac{1}{\sqrt{2}}$

② $b^2 = a^2 + c^2 - 2ac \cos B \Rightarrow 95 + \sin^2 B = 1 \Rightarrow \sin B = \frac{1}{\sqrt{2}}$

4



① $a^2 = 1^2 (1 + 2\sqrt{3}) + 19 - 19(1 + \sqrt{3}) \times \frac{1}{2}$

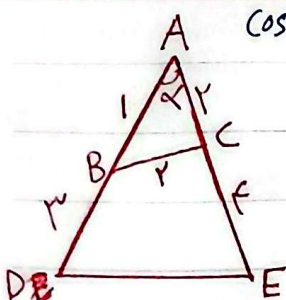
② $a^2 = 19 + 19\sqrt{3} + 19 - 19 - 19\sqrt{3} = 24 \Rightarrow a = 2\sqrt{6}$

الف

قضیه سینوس

① $\frac{2\sqrt{6}}{\sin 45^\circ} = \frac{r}{\sin B} \Rightarrow \sin B = \frac{\sqrt{2}}{2} \Rightarrow B = 45^\circ, C = 45^\circ$

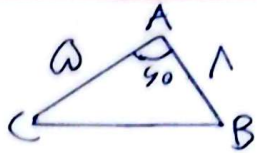
4



① $f = 1 - f \cos \alpha \Rightarrow \cos \alpha = \frac{1}{f}$

② $DE^2 = 34 + 19 - 2(9)(f)(\cos \alpha) = 52 - 12 = 40$

$DE = 2\sqrt{10}$



$$① BC^2 = 9 + 1 - 2(3)(1)(\cos 90^\circ) = 9 + 1 - 0 = 10$$

$$\boxed{BC = \sqrt{10}}$$

$$②: \frac{1}{2} \times a \times b \times \sin 90^\circ = \frac{1}{2} \times 3 \times 1 \times 1 = \frac{3}{2}$$

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

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

$$① x(a+b-c) \rightarrow a^2 + b^2 - c^2 = a^2(a+b-c) \rightarrow b^2 - c^2 = a^2b - a^2c$$

$$② (b-c)(b^2 + c^2 + bc) = a^2(b-c) \rightarrow b^2 + c^2 + bc = a^2$$

$$③ \text{مقایسه} \quad b^2 + c^2 + bc = b^2 + c^2 - 2bc \cos A \quad \Rightarrow \quad -2 \cos A = 1 \Rightarrow \boxed{\cos A = -\frac{1}{2}}$$

البته منتهی انسترا اثبات کنیم که $b \neq c$ و اتفاقاً در $b=c$ باشد معادله داره شده در مسئله قطعاً صادق خواهد بود آیا راهی برای اثبات اینده هست ؟

$$① (3 - \cos \theta)(1 + 3 \cos \theta) \times \frac{1}{2} \times \sin 90^\circ = 2$$

$$② 3 + 9 \cos \theta - \cos \theta - 3 \cos^2 \theta = 4 \quad -3 \cos^2 \theta + 8 \cos \theta - 1 = 0$$

$$\text{طالع فاکتور} \rightarrow \boxed{\cos \theta = 1}$$

$$③ a^2 = 3^2 + 1^2 - 2(3)(1)(\cos 0^\circ) = 9 + 1 - 6 = 4$$