

$$\underbrace{\hat{B} + \hat{C}}_{110^\circ} + \hat{A} = 180^\circ \Rightarrow \hat{A} = 70^\circ \quad \frac{AC}{\sin B} = \frac{BC}{\sin A}$$

$$\frac{10\sqrt{4}}{10 \sin B} = \frac{10}{\frac{10}{\sqrt{2}}} \quad \sin B = \frac{10\sqrt{2}}{40} = \frac{\sqrt{2}}{4} \Rightarrow \hat{B} = 45^\circ \Rightarrow \hat{C} = 65^\circ$$

$B + C = 110^\circ$

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$$\sin 40^\circ = \frac{x}{AC} = \frac{\sqrt{2}}{2} \Rightarrow AC = \frac{10x}{\sqrt{2}} \quad \hat{A} + \underbrace{\hat{C} + \hat{B}}_{110^\circ} = 180^\circ \quad A = 70^\circ$$

$$\frac{AC}{\sin D} = \frac{CD}{\sin A} \quad \frac{\frac{10x}{\sqrt{2}}}{\frac{\sqrt{2}}{2}} = \frac{10\sqrt{2}}{\frac{\sqrt{2}}{2}} \Rightarrow x = 10$$

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$$\frac{\sin \hat{C}}{c} = \frac{\sin \hat{B}}{b} \Rightarrow \frac{\sin C}{\sin B} = \frac{c}{b} \quad (b^2 - 1) \frac{c}{b} = \phi$$

$$b^2 - 1 = b \quad b^2 - b - 1 = 0 \quad (b-1)(b+1) = 0 \quad b = 2 \checkmark$$

$b = -1$  دور است

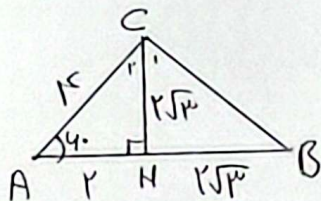
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$$S = \sqrt{p(p-a)(p-b)(p-c)} \quad p = \frac{11+10+10}{2} = 15$$

$$S = \sqrt{15 \times 4 \times 5 \times 10} = 20\sqrt{3}$$

$$S = \frac{1}{2} \times AB \times BC \times \sin B = \frac{1}{2} \times 10 \times 10 \times \sin B = 20\sqrt{3} \Rightarrow \sin B = \frac{\sqrt{3}}{2}$$

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$$AH = 10 \cos 40^\circ = 10 \quad AB = 10 + 10\sqrt{3} \Rightarrow BH = 10\sqrt{3}$$

$$CH = 10 \tan 40^\circ = 10\sqrt{3}$$

$$CH = BH \Rightarrow \hat{C}_1 = \hat{B} = 45^\circ \Rightarrow \hat{C} = 90^\circ$$

$\hat{C}_1 = 45^\circ, \hat{C}_2 = 45^\circ$

$$BC^2 = CH^2 + BH^2 = 100 \Rightarrow a = 10\sqrt{2}$$

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$$BC^2 = AC^2 + AB^2 - 2 \times AC \times AB \times \cos \alpha$$

$$F^2 = F^2 + 1 - 2 \times F \times 1 \times \cos \alpha$$

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

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

$$DE^2 = 14 + 14 - 2 \times F \times 4 \times \frac{1}{F}$$

$$DE^2 = 15 \Rightarrow DE = \sqrt{15}$$

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الف)  $4F + 14 - 2 \times 1 \times 4 \times \frac{1}{F} = BC^2 \Rightarrow BC = \sqrt{}$

ب)  $S = \frac{1}{2} \times \frac{\sqrt{15}}{F} \times 1 \times 4 = 10\sqrt{15}$

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

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

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

$$\frac{b^2 - c^2}{b - c} = a^2$$

$$b^2 + bc + c^2 = a^2$$

$$a^2 = b^2 + c^2 + bc$$

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

$$bc = -2bc \cos A$$

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

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$$\frac{1}{F} \times \sin 120^\circ (1 - \cos \theta) (1 + 1 \cos \theta) = 1$$

$(1 - \cos \theta) (1 + 1 \cos \theta) = 1$  واضح است  $\Rightarrow \cos \theta = 1 \Rightarrow AB = 2 \quad AC = F$

$$a^2 = F^2 + 14 - 2 \times F \times F \times \frac{\sqrt{15}}{F}$$

$$a^2 = F^2 - 14\sqrt{15}$$

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