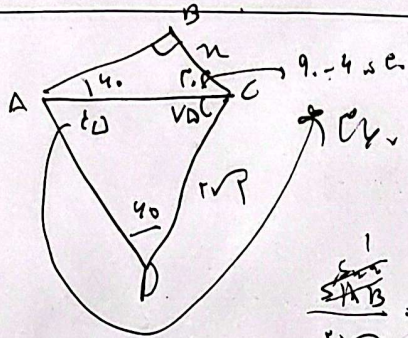


$$A = 180 - (B + C) \Rightarrow A = 40^\circ \quad \sin 40^\circ = \frac{\sqrt{2}}{2}$$

$$\frac{BC}{\sin A} = \frac{AC}{\sin B} = \frac{AB}{\sin C}$$

$$B = C \Rightarrow C = 120 - 40 = 80^\circ$$

$$\frac{r}{\frac{\sqrt{2}}{2}} = \frac{r \cdot \frac{\sqrt{2}}{2}}{\sin B} \Rightarrow \sin B = \frac{r \cdot \frac{\sqrt{2}}{2} \times \frac{\sqrt{2}}{2}}{r} = \frac{\sqrt{2}}{2} \Rightarrow B = 40^\circ$$



$$C = 80^\circ \quad \sin 80^\circ = \frac{\sqrt{2}}{2} \quad \sin 40^\circ = \frac{\sqrt{2}}{2} \quad \sin 40^\circ = \frac{\sqrt{2}}{2} \quad \sin 40^\circ = \frac{\sqrt{2}}{2}$$

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

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

$$\frac{b}{\sin B}$$

$$b^2 - r^2 = b^2 - b^2 - r^2 = -r^2$$

$$(b - r)(b + r) = -r^2 \Rightarrow b = r$$

$$AC^2 = AB^2 + BC^2 - 2AB \cdot BC \cos B$$

$$149 = 100 + 100 - 2 \cdot 10 \cdot 10 \cos B \Rightarrow \cos B = \frac{1}{2} \Rightarrow B = 60^\circ$$

$$\sin B = \pm \sqrt{1 - \cos^2 B} = \pm \frac{\sqrt{3}}{2} \Rightarrow \sin B = \frac{\sqrt{3}}{2}$$

$$a^2 = b^2 + c^2 - 2bc \cos A \Rightarrow 149 + 149 + 2 \cdot 10 \cdot 10 \cos A = a^2$$

$$a = 10\sqrt{3}$$

$$\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c} \Rightarrow \sin A = \frac{a \sin B}{b} = \frac{10\sqrt{3} \cdot \frac{\sqrt{3}}{2}}{10} = \frac{3}{2}$$

$$f = f + 1 - 2 \times \frac{1}{2} \times C.A \approx C.A \approx 2$$

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

خواندنی نیست

$$14 + 14 - 12 = f \Rightarrow DE = \sqrt{f} \Rightarrow DE = \sqrt{16}$$

$$BC^2 = AB^2 + AC^2 - 2 \times AB \times AC \times \cos A = 4^2 + 5^2 - 2 \times 4 \times 5 \times \frac{1}{2} \Rightarrow BC = 3$$

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

$$S = \frac{1}{2} \times AB \times AC \times \sin A = \frac{1}{2} \times 4 \times 5 \times \frac{1}{2} = 5$$

$$S_{ABC} = \frac{1}{2} \times 4 \times 5 \times \frac{\sqrt{2}}{2} = 5\sqrt{2}$$

$$\frac{a^2 + b^2 - c^2}{2bc} = \cos A \Rightarrow \frac{4^2 + 5^2 - 3^2}{2 \times 4 \times 5} = \cos A \Rightarrow \cos A = \frac{1}{2} \Rightarrow A = 60^\circ$$

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

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

$$\Rightarrow a^2(b+c) = a^2 \Rightarrow b+c = a$$

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

$$\frac{1}{f} \times AB \times AC \times \sin A = \frac{1}{f} (f - c \cdot \sin \theta) (1 + f \cos \theta) = 1 \Rightarrow (f - c \cdot \sin \theta) (1 + f \cos \theta) = f$$

$$f + f \cos \theta - c \sin \theta - f c \sin \theta \cos \theta = f \Rightarrow f \cos \theta - c \sin \theta = f c \sin \theta \cos \theta$$

$$BC^2 = AB^2 + AC^2 - 2 \times AB \times AC \times \cos A = 4^2 + 5^2 - 2 \times 4 \times 5 \times \cos 120^\circ = 16 + 25 + 20 = 61 \Rightarrow BC = \sqrt{61}$$

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

$$SABC = \frac{1}{4} \times \frac{1}{4} (1 + 3 \cos \theta) (3 - \cos \theta) = 2$$

$$3 - \cos \theta + 9 \cos \theta - 3 \cos^2 \theta = 8 \rightarrow -3 \cos^2 \theta + 10 \cos \theta - 5 = 0$$

$$\xrightarrow{\text{بجای}} \cos^2 \theta + 10 \cos \theta + 15 = 0 \quad \text{چون } \cos \theta = \frac{-10 \pm \sqrt{100 - 60}}{2} \quad \text{و چون } \cos \theta \leq 1$$

$$\rightarrow \cos \theta = \frac{-10 \pm \sqrt{40}}{2} = 1 \quad \text{و}$$

$$AB = 2, AC = 4 \rightarrow \text{قضیه کوسین ها} \rightarrow a^2 = b^2 + c^2 - 2(bc) \cos A$$

$$a^2 = 20 - 8\sqrt{2}$$