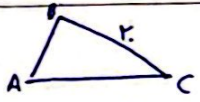


$A \approx 110 - (B+C) \approx 60^\circ$



$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C} = \frac{r}{\frac{\sqrt{2}}{2}} = \frac{r\sqrt{2}}{\frac{\sqrt{2}}{2}} \Rightarrow \frac{r\sqrt{2}}{\frac{\sqrt{2}}{2}} \Rightarrow 135^\circ \Rightarrow \boxed{60^\circ \text{ و } B} \Rightarrow \boxed{C \approx 75^\circ}$

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$AC = \frac{a}{\sin A} = \frac{d}{\sin D} = \frac{r\sqrt{2}}{\frac{\sqrt{2}}{2}} = \frac{\overline{AC}}{\frac{\sqrt{2}}{2}} \Rightarrow \overline{AC} \approx r\sqrt{2}$

$\frac{AC}{\sin B} = \frac{a}{\sin A} = \frac{r\sqrt{2}}{1} = \frac{a}{\frac{\sqrt{2}}{2}} \Rightarrow \boxed{a \approx r\sqrt{2}}$

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

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$r^2 + r^2 - 12 \cos B \approx 199 \quad r^2 + r^2 - 12 \cos B \approx 199$

$\cos B = \frac{99}{12} = \frac{199}{r \cdot 2}$



$\cos B \approx \sqrt{1 - \frac{r \sin B}{r \cos B}}$

$(r^2 + r^2) - 2(r)(r)(\cos B) = 199 \Rightarrow (r^2 + r^2) - 2(r)(r)(\cos B) = 199$

$r^2 + r^2 - 12 \cos B = 199 \Rightarrow \cos B = \frac{9}{12}$

$\sin B = \sqrt{1 - (\frac{3}{4})^2} = \frac{\sqrt{7}}{4} \rightarrow \text{زاویه } B \rightarrow \boxed{\frac{\pi}{4}}$

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$r^2 + r^2 + (r+r)^2 - 2r(1+\sqrt{2}) \approx 199 \Rightarrow r^2 + r^2 + 4r^2 - 2r(1+\sqrt{2}) \approx 199 \Rightarrow 6r^2 - 2r(1+\sqrt{2}) \approx 199$

$\frac{r\sqrt{2}}{\sin 45^\circ} = \frac{r}{\sin B} \Rightarrow \sin B = \frac{r \times \frac{\sqrt{2}}{2}}{r\sqrt{2}} = \frac{\sqrt{2}}{2}$

$B \approx 45^\circ \rightarrow C \approx 70^\circ$

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$$\frac{1}{s} \rightarrow \frac{r}{0} \rightarrow (1r)$$

$$ABC \xrightarrow{D_{100}} \rightarrow r^2 + 1^2 - r(r)(1)(c \cdot sA) = r^2 \rightarrow r \cdot c \cdot sA = 1 \rightarrow c \cdot sA = \frac{1}{r}$$

$$ADE \xrightarrow{D_{100}} \rightarrow 4^2 + r^2 - r(r)(4)(\frac{1}{2}) = 16 + 1r - 1r = 16$$

$$DE^2 = 16 \rightarrow DE = \underline{4}$$

$$4f + 20 = f \cdot \frac{1}{r} = 4 \cdot 5 \rightarrow \boxed{BC = 5}$$

$$S_{AN} = \frac{1}{r} \times 1 \times 0 \times \frac{\sqrt{r}}{r} \rightarrow \boxed{1 \cdot \sqrt{r}}$$

$$b^2 + c^2 + rbc - b^2 - c^2 + rbc = fbc \Rightarrow \frac{f}{\cos A + 1}$$

$$a^2 = b^2 + c^2 - rbc \cdot c \cdot sA \rightarrow b^2 + c^2 + rbc - b^2 - c^2 + rbc \cdot c \cdot sA$$

$$\frac{rbc(c \cdot sA + 1)}{bc(c \cdot sA + 1)} = \underline{r}$$

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

$$(b^2 + bc + c^2)(b - c) = (b^2 + c^2 + rbc)(b - c)$$

$$b^2 + bc + c^2 = b^2 + c^2 + rbc \quad rbc =$$

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

$$b - c = a(b - c)$$

$$b^2 + c^2 + bc = a^2 \rightarrow b^2 + c^2 - bc = b^2 + c^2 - rbc \cdot c \cdot sA$$

$$c \cdot sA = \frac{1}{r} \rightarrow \underline{A = 120^\circ}$$

$$\frac{1}{r}(r - \cos \theta)(1 + r \cos \theta) \times \frac{1}{r} = r$$

$$\cos \theta > 0$$

$$r + r \cos \theta - \cos \theta = 1$$

$$-r \cos \theta + 1 \cos \theta - 1 = 0$$

$$\cos \theta + 1 \cos \theta + 1 = 0$$

$$(\cos \theta + 1)(\cos \theta + 1) = 0$$

$$\cos \theta = -1$$

$$a^2 = (r^2)^2 + (r \cdot 1)^2 - r \cdot r \cdot 1 \cdot 1 \cdot \frac{\sqrt{r}}{r}$$

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

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

$$\xrightarrow{\text{بجای}} \cos^2 \theta + 10 \cos \theta + 15 = 0 \quad \text{فقط} \quad \cos \theta = \frac{-10}{-2} = 5$$

$$\rightarrow \cos \theta = \frac{5}{2} = 2.5 \quad \text{و}$$

$$AB = 2, \quad AC = 4 \rightarrow \text{قضیه کوسینس} \rightarrow a^2 = 2^2 + 4^2 - 2(2)(4)\left(\frac{\sqrt{3}}{2}\right)$$

$$a^2 = 20 - 8\sqrt{3}$$