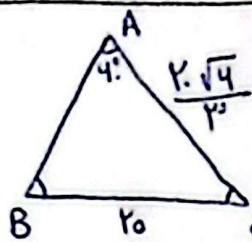


14.75

نام و نام خانوادگی: باسختنامه تشریحی تکلیف شماره 13. کلاس:

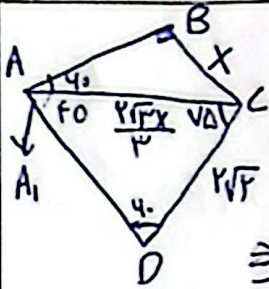


$$\hat{A} + \hat{B} + \hat{C} = 180^\circ \Rightarrow \hat{A} = 4^\circ$$

$$\frac{bc}{\sin 4^\circ} = \frac{\frac{2\sqrt{4}}{3}}{\sin B} \Rightarrow \frac{2}{\frac{2}{3}} = \frac{2\sqrt{4}}{\sin B}$$

1.75

$$\Rightarrow \frac{2\sqrt{4}}{3} \times \sin B = \frac{2\sqrt{4}}{3} \Rightarrow \sin B = \frac{\sqrt{4}}{2} \Rightarrow B = 45^\circ, C = 14^\circ \rightarrow C = 75^\circ$$



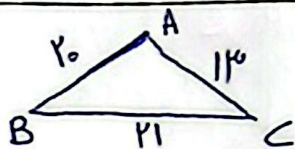
$$A_1 = 60, \frac{x}{\sin 4^\circ} = \frac{AC}{\sin 9^\circ} \Rightarrow AC = \frac{2x}{\sqrt{3}} = \frac{2\sqrt{3}x}{3}$$

$$\frac{2\sqrt{3}}{\sin 60^\circ} = \frac{2\sqrt{3}x}{\sin 4^\circ} \Rightarrow \frac{2\sqrt{3}}{\frac{\sqrt{3}}{2}} = \frac{2\sqrt{3}x}{\frac{\sqrt{3}}{2}}$$

$$\Rightarrow x = \frac{2}{3} \Rightarrow x = 1$$

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

$$\Rightarrow b^2 - r = b \Rightarrow b^2 - b - r = 0 \Rightarrow (b - r)(b + 1) = 0 \Rightarrow \begin{cases} b = r \\ b = -1 \end{cases}$$

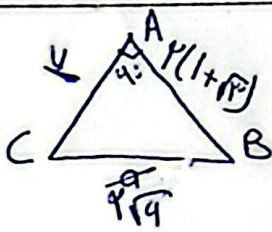


$$AC^2 = AB^2 + BC^2 - 2AB \cdot BC \cdot \cos B$$

$$\Rightarrow 14^2 = 2^2 + 11^2 - 2 \times 2 \times 11 \times \cos B$$

$$149 = 4 + 121 - 44 \cos B$$

$$\cos B + \sin^2 B = 1 \Rightarrow 149 + \sin^2 B = 1 \Rightarrow \sin^2 B = \frac{4}{11} \Rightarrow \sin B = \frac{2}{\sqrt{11}}$$

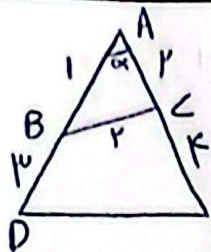


$$a^2 = c^2 + (2 + 2\sqrt{3})^2 - 2 \times c \times (2 + 2\sqrt{3}) \times \cos 4^\circ$$

$$a^2 = 14 + 4 + 12\sqrt{3} + 12 - 4\sqrt{3} \cos 4^\circ$$

$$\Rightarrow a^2 = 4 \Rightarrow a = 2 = \sqrt{4} = 2\sqrt{4}$$

$$\frac{2}{\sin B} = \frac{2\sqrt{4}}{\frac{2}{\sqrt{11}}} \Rightarrow \frac{2}{\sin B} = 2\sqrt{4} \Rightarrow \sin B = \frac{1}{\sqrt{4}} = \frac{1}{2} \Rightarrow \sin B = \frac{\sqrt{4}}{2} \Rightarrow B = 45^\circ, C = 70^\circ$$



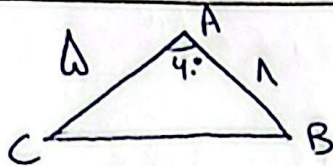
$$BC^2 = AC^2 + AB^2 - 2AC \cdot AB \cos \alpha$$

$$1^2 = r^2 + 1^2 - 2r \cos \alpha \Rightarrow r \cos \alpha = 1 \Rightarrow \cos \alpha = \frac{1}{r}$$

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

$$DE^2 = 1^2 + 1^2 - 2 \times 1 \times 1 \times \frac{1}{r}$$

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



$$BC^2 = AB^2 + AC^2 - 2AB \cdot AC \cos 4^\circ$$

$$BC^2 = 1^2 + 1^2 - 2 \times 1 \times 1 \times \frac{1}{r}$$

$$\Rightarrow BC^2 = 1^2 - \frac{2}{r} \Rightarrow BC^2 = \frac{r^2 - 2}{r} \Rightarrow BC = \sqrt{\frac{r^2 - 2}{r}}$$

$$S = \frac{1}{2} \times AC \times AB \times \sin 4^\circ = \frac{1}{2} \times 1 \times 1 \times \frac{\sqrt{r^2 - 2}}{r} = \frac{1}{2} \sqrt{\frac{r^2 - 2}{r}}$$

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

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

$$\text{حاصل ضرب} = 2bc(1 + \cos A)$$

$$\text{حاصل ضرب} = \frac{2bc(1 + \cos A)}{bc(1 + \cos A)} \Rightarrow \text{حاصل ضرب} = 2$$

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

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

$$\Rightarrow b^2 + c^2 + bc = b^2 + c^2 - 2bc \cos A \Rightarrow \cos A = \frac{-1}{2} \Rightarrow A = 120^\circ$$

$$S = \frac{1}{2} AB \cdot AC \times \sin \theta \Rightarrow \frac{(1 - \cos \theta)(1 + \cos \theta)}{2} = \frac{1}{2}$$

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

$$\frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{1 \pm \sqrt{4 - 4}}{2} = \frac{1 \pm 0}{2} = \frac{1}{2}$$

$$\cos \theta = \frac{1}{2} \Rightarrow \theta = 60^\circ$$

$$a^2 = r^2 + r^2 - 2 \times r \times r \times \frac{\sqrt{3}}{2} \Rightarrow a^2 = 2 - \sqrt{3}$$