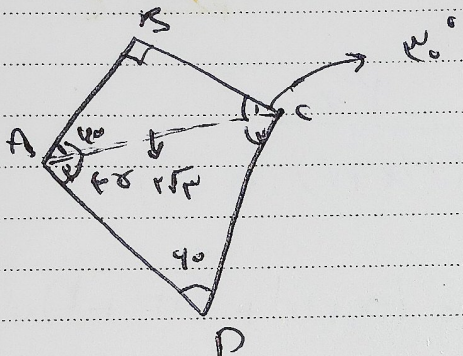


$$\hat{B} + \hat{C} = 120^\circ \Rightarrow \hat{A} + \hat{B} + \hat{C} = 180^\circ$$

$$\Rightarrow \hat{A} = 60^\circ$$

$$\frac{\sin 40^\circ}{2} = \frac{\sin \hat{B}}{2\sqrt{2}} \Rightarrow \sin \hat{B} = \frac{\sqrt{2}}{2} \rightarrow \hat{B} = 45^\circ$$

$$\hat{B} + \hat{C} = 120^\circ \Rightarrow \hat{C} = 75^\circ$$



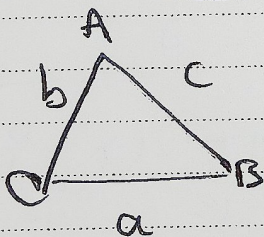
$$\hat{A}_1 + \hat{B} + \hat{C}_1 = 180^\circ$$

$$\Rightarrow \hat{C}_1 = 45^\circ$$

$$\hat{A}_1 + \hat{C}_1 + \hat{D} = 180^\circ \Rightarrow \hat{A}_1 = 65^\circ$$

$$\frac{2\sqrt{2}}{\sin 65^\circ} = \frac{AC}{\sin 40^\circ} \Rightarrow \frac{2\sqrt{2}}{\frac{\sqrt{2}}{2}} = \frac{AC}{\frac{\sqrt{2}}{2}}$$

$$AC \times \sin 40^\circ = x \Rightarrow 2\sqrt{2} \times \frac{\sqrt{2}}{2} = x$$



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

$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

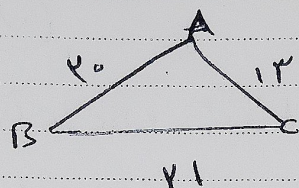
$$b \frac{\sin C}{\sin B} = c$$

$$\Rightarrow b^2 - 2 = b \Rightarrow b^2 - b - 2 = 0$$

$$a + c = b$$

$$b = -1, b = 2$$

✓ لنگه سب است



$$a^2 = b^2 + c^2 - 2bc \cos \hat{A} \quad (14)$$

$$14^2 = 20^2 + 12^2 - 2 \cdot 20 \cdot 12 \cdot (\cos \hat{B})$$

$$\cos \hat{B} = \frac{20^2 + 12^2 - 14^2}{2 \cdot 20 \cdot 12}$$

$$\sin^2 \hat{B} + \cos^2 \hat{B} = 1$$

$$\sin^2 \hat{B} + \frac{14}{20} = 1 \Rightarrow \sin^2 \hat{B} = \frac{6}{20}$$

$$\Rightarrow \sin \hat{B} = \frac{3}{5}$$

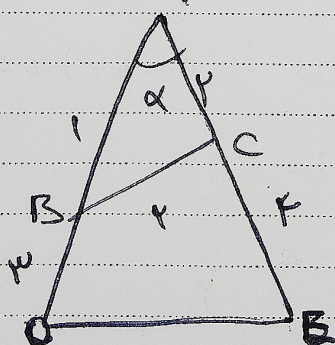
(الف) $a^2 = 14^2 + 20(1 + 12 + 12\sqrt{3}) - (14(1 + \sqrt{3}) \frac{1}{\sqrt{3}})$ (15)

$$a^2 = 14^2 + 20 + 240 + 18\sqrt{3} - 14\sqrt{3} = 240 + 4\sqrt{3} \Rightarrow a = 2\sqrt{4}$$

ب) $\frac{a}{\sin \hat{A}} = \frac{b}{\sin \hat{B}} = \frac{c}{\sin \hat{C}} \Rightarrow \frac{2\sqrt{4}}{\frac{\sqrt{3}}{2}} = \frac{2}{\sin \hat{B}} \Rightarrow \sin \hat{B} = \frac{\sqrt{3}}{2}$

تعطیل به مناسبت عید سعید فطر

$$\hat{B} = 60^\circ$$



$$a^2 = b^2 + c^2 - 2bc \cos \hat{A} \quad (16)$$

$$1 = 1 + 1 - 2 \cdot 1 \cdot 1 \cdot \cos \alpha = 2 \cos \alpha = \frac{1}{\sqrt{3}}$$

$$(DE)^2 = 1^2 + 1^2 - 2 \cdot 1 \cdot 1 \cdot (\cos \alpha)$$

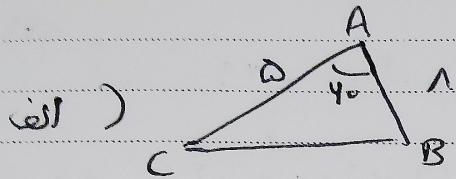
$$(DE)^2 = 1 \Rightarrow DE = \sqrt{1}$$

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(✓)

۱۴۴۵ سوال ۴

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

$$(BC)^2 = 4^2 + 1^2 - 10 \left(\frac{1}{2} \right) \Rightarrow (BC)^2 = 19$$

$$\Rightarrow BC = \sqrt{19}$$

$$b) S_{\triangle ABC} = \frac{1}{2} bc \sin A \Rightarrow \frac{1}{2} \times 1 \times 4 \times \frac{\sqrt{3}}{2} = 10\sqrt{3}$$

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

$$(b+c)^2 - a^2$$

$$bc (\cos A + 1)$$

$$\Rightarrow 2bc (\cos A + 1)$$

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

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

(1)

$$\frac{a^3 + b^3 - c^3}{a + b - c}$$

$$= a^2 \Rightarrow a^3 + b^3 - c^3 = a^2(a + b - c)$$

$$a + b - c$$

$$\Rightarrow b^3 - c^3 = a^2 b - a^2 c \Rightarrow (b-c)(b^2 + bc + c^2) = a^2(b-c)$$

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

$$2 \cos A = 1 \Rightarrow \cos A = \frac{1}{2}$$

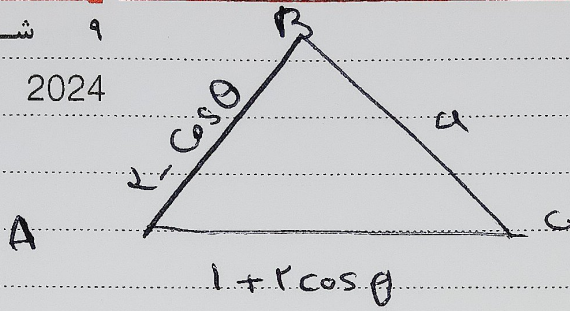
۳۰ فروردین
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(۱۰)



$$\frac{1}{r} \times (1 + r \cos \theta) \times (r - \cos \theta) \times \frac{1}{r} = 2$$

$$-r \cos \theta + 1 \cos \theta - \Delta = 0 \xrightarrow{a+b+c=0} \cos \theta = 1$$

$r_1 = 1, r_2 = \frac{c}{a}$ $-1 \leq \cos \theta \leq 1$

$\hookrightarrow \cos \theta = \frac{\Delta}{r}$

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

$$a^2 = 14 + 1 - 1\sqrt{13} \Rightarrow a^2 = 15 - 1\sqrt{13}$$

۳۱ فروردین
جمعه

۱۴۴۵ ۱۰ شوال

19 Apr 2024