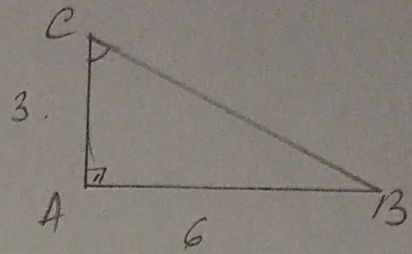


Testul 1

1. Ip: $\triangle ABC$, $m(\angle A) = 90^\circ$
 $AB = 6 \text{ cm}$, $AC = 3 \text{ cm}$
 C: $\sin \hat{C} = ?$



Rezolvare:

$$\sin \hat{C} = \frac{\text{cateta opusă}}{\text{ipotenuză}} = \frac{AB}{BC}$$

Aplicând Th. lui Pitagora $\Rightarrow BC^2 = AB^2 + AC^2$

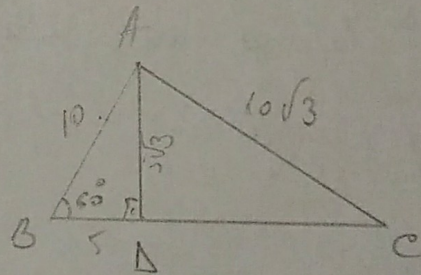
$$BC^2 = 6^2 + 3^2$$

$$BC = \sqrt{36 + 9} = \sqrt{45}$$

$$BC = 3\sqrt{5} \text{ cm}$$

$$\sin \hat{C} = \frac{6}{3\sqrt{5}} = \frac{\sqrt{5}}{\sqrt{5}} = \frac{2\sqrt{5}}{5} \Rightarrow \sin \hat{C} = \frac{2\sqrt{5}}{5}$$

2. Ip: $\triangle ABC$, $AB = 10 \text{ cm}$
 $AC = 10\sqrt{3} \text{ cm}$
 $m(\angle B) = 60^\circ$



C: a) $BC = ?$

b) $\triangle ABC$

Rezolvare:

Sucem $AD \perp BC \Rightarrow m(\widehat{ADB}) = 90^\circ$
 $m(\widehat{ABD}) = 60^\circ \Rightarrow m(\widehat{BAD}) = 180 - (90 + 60) = 30^\circ$

În $\triangle ADB$, $m(\hat{D}) = 90^\circ$, $m(\hat{A}) = 30^\circ$
 $\xRightarrow{\text{Th. } \times 30^\circ} BD = \frac{AB}{2} = \frac{10}{2} = 5 \text{ cm}$

Th. lui Pitagora $\Rightarrow AD^2 = AB^2 - BD^2 = 10^2 - 5^2 = 100 - 25$
 $AD = \sqrt{75} = 5\sqrt{3} \text{ cm}$

$$\widehat{\text{In}} \Delta ADC \ (m(\angle A) = 90^\circ) \xrightarrow{\text{Th. lui Pitagora}} DC^2 = AC^2 - AD^2$$

$$DC^2 = (10\sqrt{3})^2 - (5\sqrt{3})^2$$

$$DC^2 = 300 - 75$$

$$DC = \sqrt{225} = 15 \text{ cm}$$

$$BC = BD + DC = 5 + 15 = 20 \text{ cm}$$

$\widehat{\text{In}} \Delta ABC$

$$BC^2 = AB^2 + AC^2 \Leftrightarrow 20^2 = 10^2 + (10\sqrt{3})^2 \Leftrightarrow$$

$$\Leftrightarrow 400 = 100 + 300 \Leftrightarrow 400 = 400 \quad (A) \xrightarrow{\text{Reciproca Th. lui Pitagora}}$$

$\Rightarrow \Delta ABC$ dreptunghic, $m(\angle A) = 90^\circ$

3. $\widehat{\text{f}}: \Delta ABC$ dreptunghic, $m(\angle BAC) = 90^\circ$

AD înălțime, $D \in (BC) \Rightarrow AD \perp BC$

$BC = 16 \text{ cm}$, $CD = 4 \text{ cm}$

c) a) $A_{\Delta ABC} = ?$

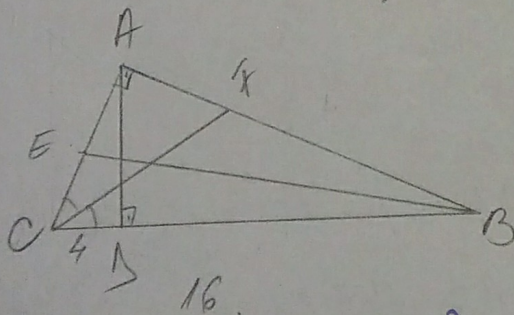
b) lungimea medianei din $B = ?$

c) lungimea bisectoarei din $C = ?$

Rezolvare:

$$A_{\Delta ABC} = \frac{AD \cdot BC}{2} = \frac{4\sqrt{3} \cdot 16}{2} = 32\sqrt{3} \text{ cm}^2$$

$$BD = BC - CD = 16 - 4 = 12 \text{ cm}$$



$$\text{Th. înălțimii} \Rightarrow AD^2 = CD \cdot DB \Rightarrow AD^2 = 4 \cdot 12 \Rightarrow AD = \sqrt{48} \Rightarrow$$

$$\Rightarrow AD = 4\sqrt{3} \text{ cm}$$

$$BE \text{ mediană} \Rightarrow AE = EC = \frac{AC}{2} = \frac{8}{2} = 4 \text{ cm}$$

$$\text{Th. catetei} \Rightarrow AC^2 = BC \cdot CD \Rightarrow AC^2 = 16 \cdot 4 \Rightarrow AC^2 = 64 \Rightarrow$$

$$\Rightarrow AC = \sqrt{64} \Rightarrow AC = 8 \text{ cm}$$

$$\Delta ABE \quad (\widehat{A} = 90^\circ)$$

$$\text{Th. lui Pitagora} \Rightarrow BE^2 = AE^2 + AB^2$$

$$\Delta ABC$$

$$\text{Th. catetui} \Rightarrow AB^2 = BC \cdot BA \Rightarrow AB^2 = 16 \cdot 12 \Rightarrow AB = \sqrt{192} = 8\sqrt{3} \text{ cm}$$

$$BE^2 = 4^2 + (8\sqrt{3})^2 \Leftrightarrow BE^2 = 16 + 192 \Leftrightarrow BE^2 = 208 \Rightarrow \\ \Rightarrow BE = \sqrt{208} \Rightarrow BE = 4\sqrt{13} \text{ cm}$$

$$\Delta ABC$$

$$\sin \hat{C} = \frac{AB}{BC} \Rightarrow \sin \hat{C} = \frac{8\sqrt{3}}{16} \Rightarrow \sin \hat{C} = \frac{\sqrt{3}}{2} \Rightarrow m(\hat{C}) = 60^\circ$$

$$m(\hat{B}) = 180^\circ - (90^\circ + 60^\circ) = 180^\circ - 150^\circ = 30^\circ$$

$$\text{Fie } CF \text{ bisectoarea } \sphericalangle ACB \Rightarrow m(\widehat{ACF}) = m(\widehat{FCB}) = \frac{60^\circ}{2} = 30^\circ$$

În ΔCAF dreptunghiuc.

$$\cos(\widehat{ACF}) = \frac{AC}{CF} \Leftrightarrow \cos 30^\circ = \frac{8}{CF} \Leftrightarrow \frac{\sqrt{3}}{2} = \frac{8}{CF} \Rightarrow$$

$$\Rightarrow CF = \frac{16}{\sqrt{3}} \text{ cm} \Rightarrow CF = \frac{16\sqrt{3}}{3} \text{ cm}$$