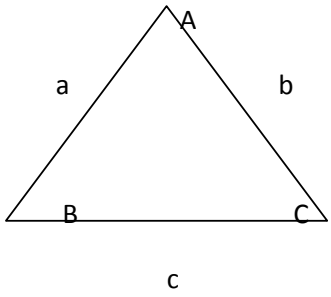
Question #30923

The lengths of a triangle measure 27, 46 and 67 cm. find the measure of each angle of the triangle?

Solution.



Let $a = 27, b = 46, c = 67$. Using the law of cosines, we have $c^2 = a^2 + b^2 - 2abcos(\angle A)$. It follows that

$$cos(\angle A) = \frac{a^2 + b^2 - c^2}{2ab} = \frac{27 \cdot 27 + 46 \cdot 46 - 67 \cdot 67}{2 \cdot 27 \cdot 46} \approx -0{,}66.$$

Thus, $\angle A \approx 131{,}3^o$.

By analogy, $cos(\angle B) = \frac{a^2+c^2-b^2}{2ac} = \frac{27 \cdot 27+67 \cdot 67-46 \cdot 46}{2 \cdot 27 \cdot 67} \approx 0{,}86$.

Then $\angle B \approx 30{,}9^o$.

Since, $\angle A + \angle B + \angle C = 180^0$, then $\angle C \approx 17{,}2^o$.

Answer. $\angle A \approx 131{,}3^o, \angle B \approx 30{,}9^o, \angle C \approx 17{,}2^o$.