

More Cosine Law Exercises

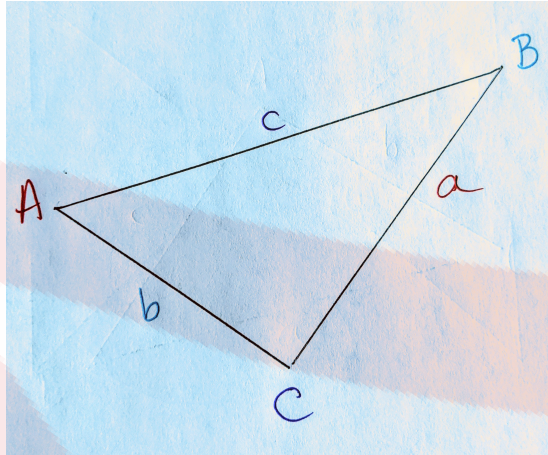
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2020

Cosine Law

The other relationship or law is the **Cosine Law**.



The **Cosine Law** is given by,

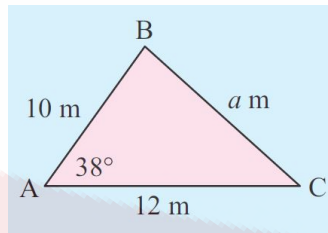
$$c^2 = a^2 + b^2 - 2ab \cos C$$

The cosine law is great when,

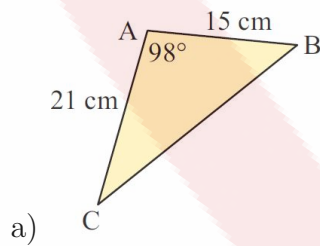
1. All side lengths of a triangle are given.
2. Two side lengths and the contained angle are given.

Exercises

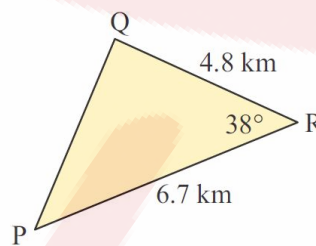
1. Find the length of BC in the triangle below.



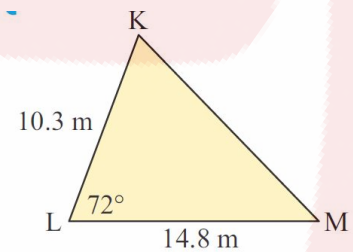
2. Find length of the remaining side in the triangles below.



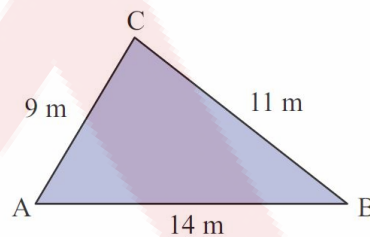
b)



c)

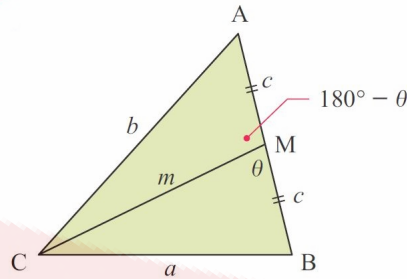


3. Find the measure of all the angles in the triangle below.



4. Find the smallest angle of the triangle with sides 9cm , 11cm and 13cm .
 5. Find the largest angle of the triangle with sides 3cm , 5cm and 7cm .

6. For the given triangle,

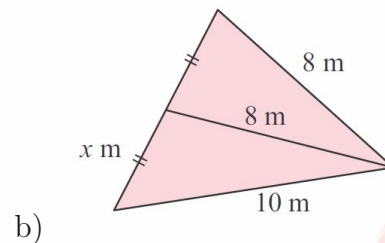
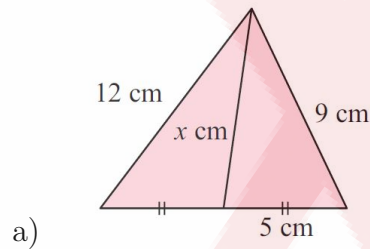


- Use the cosine rule to find $\cos \theta$ in terms of a , c and m .
- Use the cosine rule to find $\cos(180^\circ - \theta)$ in terms of b , c and m .
- Use the fact: $\cos(180^\circ - \theta) = -\cos \theta$ to prove,

$$a^2 + b^2 = 2m^2 + 2c^2,$$

knowns as **Apollonius' median theorem**.

7. For the following triangles find the side x .



8. For triangle $\triangle ABC$, with side lengths $AB = 10\text{cm}$, $AC = 9\text{cm}$ and angle $\angle ABC = 60^\circ$. Let $BC = x$ cm.

- Use the cosine rule to show that x is a solution of $x^2 - 10x + 19 = 0$.
- Solve the above equation for x .
- Use a diagram and a compass to explain why there are two possible values for x .