

## Law Of Cosines Worksheet Questions and Answers PDF

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### Part 1: Building a Foundation

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**What is the formula for the Law of Cosines when solving for side c?**

*Hint: Recall the formula that relates the sides and angles of a triangle.*

- A)  $c^2 = a^2 + b^2 + 2ab \cdot \cos(C)$
- B)  $c^2 = a^2 + b^2 - 2ab \cdot \cos(C)$  ✓
- C)  $c^2 = a^2 - b^2 + 2ab \cdot \cos(C)$
- D)  $c^2 = a^2 + b^2 - 2ab \cdot \sin(C)$

■ The correct formula is B)  $c^2 = a^2 + b^2 - 2ab \cdot \cos(C)$ .

**Which of the following are variations of the Law of Cosines?**

*Hint: Identify the correct formulas that represent the Law of Cosines.*

- A)  $a^2 = b^2 + c^2 - 2bc \cdot \cos(A)$  ✓
- B)  $b^2 = a^2 + c^2 - 2ac \cdot \cos(B)$  ✓
- C)  $a^2 = b^2 + c^2 + 2bc \cdot \cos(A)$
- D)  $b^2 = a^2 + c^2 + 2ac \cdot \cos(B)$

■ The correct variations are A) and B).

**Explain how the Law of Cosines is a generalization of the Pythagorean Theorem.**

*Hint: Consider the conditions under which the Pythagorean Theorem applies.*

**The Law of Cosines generalizes the Pythagorean Theorem by applying to all triangles, not just right triangles.**

**List the three formulas of the Law of Cosines used to find each side of a triangle.**

*Hint: Think about the relationships between the sides and angles.*

1. Formula for side c:

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

2. Formula for side a:

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

3. Formula for side b:

$$b^2 = a^2 + c^2 - 2ac \cdot \cos(B)$$

The three formulas are:  $c^2 = a^2 + b^2 - 2ab \cdot \cos(C)$ ,  $a^2 = b^2 + c^2 - 2bc \cdot \cos(A)$ ,  $b^2 = a^2 + c^2 - 2ac \cdot \cos(B)$ .

## Part 2: Understanding and Interpretation

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**In which scenario would you use the Law of Cosines instead of the Pythagorean Theorem?**

*Hint: Consider the types of triangles and the information given.*

- A) When the triangle is a right triangle
- B) When only two sides of a triangle are known
- C) When two sides and the included angle of a triangle are known ✓
- D) When all angles of a triangle are known

■ The correct scenario is C) When two sides and the included angle of a triangle are known.

**Which of the following statements about the Law of Cosines are true?**

*Hint: Evaluate the statements based on your understanding of the Law of Cosines.*

- A) It can be used to find an angle when all three sides are known. ✓
- B) It is only applicable to right triangles.
- C) It can be used to find a side when two sides and the included angle are known. ✓
- D) It is a special case of the Pythagorean Theorem.

■ The true statements are A) and C).

**Describe a real-world situation where the Law of Cosines might be applied.**

*Hint: Think about scenarios involving triangles in fields like engineering or navigation.*

■ The Law of Cosines can be applied in navigation to determine distances between points when angles and sides are known.

### Part 3: Application and Analysis

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**Given a triangle with sides  $a = 5$ ,  $b = 7$ , and angle  $C = 60^\circ$ , what is the length of side  $c$ ?**

Hint: Use the Law of Cosines to calculate the length of side  $c$ .

- A) 6 ✓  
 B) 7  
 C) 8  
 D) 9

■ The length of side  $c$  is A) 6.

**If a triangle has sides  $a = 8$ ,  $b = 15$ , and  $c = 17$ , which angles can be calculated using the Law of Cosines?**

Hint: Consider the relationships between the sides and angles.

- A) Angle A ✓  
 B) Angle B ✓  
 C) Angle C ✓  
 D) None of the angles

■ The angles A, B, and C can all be calculated using the Law of Cosines.

**Solve for angle A in a triangle where  $a = 10$ ,  $b = 14$ , and  $c = 18$  using the Law of Cosines. Show your work.**

Hint: Use the Law of Cosines formula to find angle A.

■ To find angle A, use the formula and solve for A using the cosine inverse.

**How does the Law of Cosines help in determining whether a triangle is acute, right, or obtuse?**

Hint: Think about the relationships between the angles and sides.

- A) By comparing the calculated angle to 90 degrees  
 B) By checking if the sides satisfy the Pythagorean Theorem  
 C) By ensuring all angles are less than 90 degrees  
 D) By comparing the cosine of the angle to zero ✓

The Law of Cosines helps by comparing the cosine of the angle to zero.

## Part 4: Evaluation and Creation

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Evaluate the following scenarios and select those where the Law of Cosines is necessary:

*Hint: Consider the conditions under which the Law of Cosines is applied.*

- A) Finding the third side of a triangle with two sides and an included angle known. ✓
- B) Solving a right triangle with two sides known.
- C) Determining the angles of a triangle with all sides known. ✓
- D) Calculating the area of a triangle with base and height known.

The necessary scenarios are A) and C).

Create a real-world problem that involves using the Law of Cosines to find a missing side or angle. Provide a solution to your problem.

*Hint: Think about practical applications in fields like architecture or navigation.*

The problem should involve a triangle where the Law of Cosines is applied to find a missing measurement.