

## Law of Cosines Quiz Answer Key PDF

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**Which of the following are equivalent to the Law of Cosines for angle A? (Select all that apply)**

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

**What type of triangles can the Law of Cosines be applied to?**

- A. Only right triangles
- B. Only acute triangles
- C. Only obtuse triangles
- D. All types of triangles ✓**

**Which formula represents the Law of Cosines for side c?**

- 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 Law of Cosines is most similar to which other mathematical theorem when the angle is 90 degrees?**

- A. Law of Sines
- B. Pythagorean Theorem ✓**
- C. Law of Tangents
- D. Sine Rule

**If a triangle has sides  $a = 5$ ,  $b = 7$ , and angle  $C = 60^\circ$ , which formula would you use to find side  $c$ ?**

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

Which of the following statements about the Law of Cosines are true? (Select all that apply)

A. It can be used for any triangle ✓

B. It only applies to right triangles

C. It simplifies to the Pythagorean theorem when the angle is 90 degrees ✓

D. It involves the sine function

Explain how the Law of Cosines can be used to find an unknown angle in a triangle.

To find an unknown angle using the Law of Cosines, you rearrange the formula to solve for the cosine of the angle. For example, if you know all three sides  $a$ ,  $b$ , and  $c$ , you can use the formula  $\cos(C) = (a^2 + b^2 - c^2) / (2ab)$  to find angle  $C$ .

Describe a real-life scenario where the Law of Cosines might be applied.

The Law of Cosines can be used in navigation to determine the distance between two points on a map when the angle between them and the distances from a third point are known.

How does the Law of Cosines relate to the Pythagorean Theorem?

The Law of Cosines generalizes the Pythagorean Theorem. When the angle is 90 degrees, the cosine term becomes zero, and the Law of Cosines simplifies to the Pythagorean Theorem.

Why is it important to use the correct unit (degrees or radians) for angles when applying the Law of Cosines?

Using the correct unit is crucial because the cosine function depends on the angle's measurement. Incorrect units can lead to wrong calculations and results.

Provide a step-by-step solution using the Law of Cosines to find the third side of a triangle with sides  $a = 8$ ,  $b = 6$ , and angle  $C = 45^\circ$ .

1. Use the formula  $c^2 = a^2 + b^2 - 2ab \cdot \cos(C)$ . 2. Substitute the values:  $c^2 = 8^2 + 6^2 - 2 \cdot 8 \cdot 6 \cdot \cos(45^\circ)$ . 3. Calculate:  $c^2 = 64 + 36 - 96 \cdot 0.7071$ . 4. Simplify:  $c^2 = 100 - 67.68$ . 5.  $c^2 = 32.32$ . 6.  $c = \sqrt{32.32} \approx 5.68$ .

**Discuss the significance of the cosine function in the Law of Cosines and how it affects the calculations.**

The cosine function in the Law of Cosines is significant because it allows for the calculation of the length of a side or the measure of an angle in any triangle, using the formula:  $c^2 = a^2 + b^2 - 2ab \cdot \cos(C)$ . This relationship is vital for solving triangles that are not right-angled.

**In which scenarios is the Law of Cosines useful? (Select all that apply)**

- A. Finding an unknown side when two sides and the included angle are known ✓
- B. Finding an unknown angle when all three sides are known ✓
- C. Solving right triangles
- D. Calculating the area of a triangle

**In the formula  $a^2 = b^2 + c^2 - 2bc \cdot \cos(A)$ , what does A represent?**

- A. The angle opposite side a ✓
- B. The angle opposite side b
- C. The angle opposite side c
- D. The angle opposite side d

**What happens to the Law of Cosines formula when angle C is  $90^\circ$ ?**

- A. It becomes the Law of Sines
- B. It becomes the Pythagorean Theorem ✓
- C. It becomes the Law of Tangents
- D. It becomes invalid

**Which angle is used in the Law of Cosines formula  $c^2 = a^2 + b^2 - 2ab \cdot \cos(C)$ ?**

- A. Angle A
- B. Angle B
- C. Angle C ✓

D. Angle D

**What is the primary trigonometric function used in the Law of Cosines?**

- A. Sine
- B. Cosine ✓**
- C. Tangent
- D. Secant

**Which of the following are correct forms of the Law of Cosines? (Select all that apply)**

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

**What does the Law of Cosines help determine in a triangle? (Select all that apply)**

- A. Length of a side ✓**
- B. Measure of an angle ✓**
- C. Area of the triangle
- D. Perimeter of the triangle

**What are the components needed to apply the Law of Cosines? (Select all that apply)**

- A. Two sides and the included angle ✓**
- B. Three sides ✓**
- C. Two angles and a side
- D. One side and two angles