

Geometry - Law of Sines and Law of Cosines - Quiz

Common Core G-SRT.D.9, G-SRT.D.10, G-SRT.D.11 · maths-pdf.fr/en/

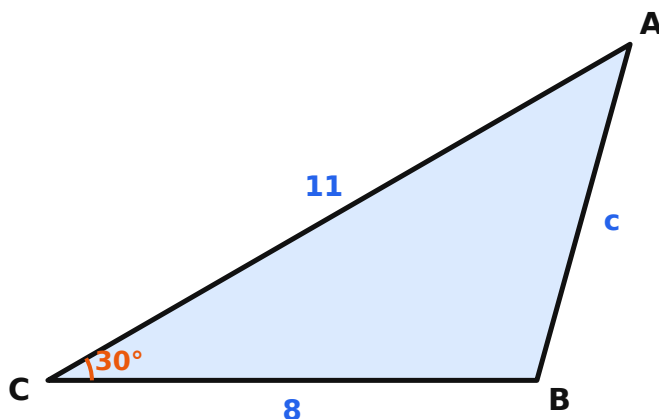
Name: _____ Class: _____ Date: ____/____/____

Test your understanding of the Law of Sines and the Law of Cosines with this 10-question multiple-choice quiz. Each question has one correct answer, and the explanation after it names the typical mistake behind the wrong choices. Take it after the lesson or before the test.

Geometry · Common Core State Standards: **G-SRT.D.9, G-SRT.D.10, G-SRT.D.11**

Questions

Question 1



$$\text{Area} = (1/2)(8)(11) \sin 30^\circ = 22.$$

Two sides are 8 and 11 with an included angle of 30 degrees. What is the area?

- A. 22
- B. 44
- C. 88
- D. 38

Question 2

The Law of Sines says that $a / \sin A$ equals

- A. $b / \cos B$

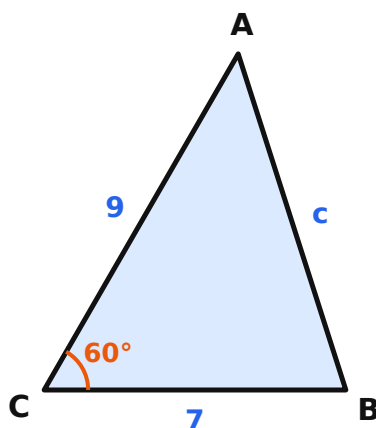
- B. $\sin B / b$
- C. $b / \sin B$
- D. $b \times \sin B$

Question 3

Which law do you use first with two sides and the included angle?

- A. Law of Sines
- B. Law of Cosines
- C. Pythagorean theorem only
- D. Area formula only

Question 4



Law of Cosines: $c^2 = a^2 + b^2 - 2ab \cos C$.

Sides 7 and 9 have an included angle of 60 degrees. What is c^2 ?

- A. 67
- B. 130
- C. 193
- D. 16

Question 5

In triangle ABC, $A = 30$ degrees, $a = 10$ and $B = 90$ degrees. What is b ?

- A. 5
- B. 10
- C. 20
- D. 17.3

Question 6

A triangle has sides 3, 4 and 5. What does the Law of Cosines give for the angle opposite 5?

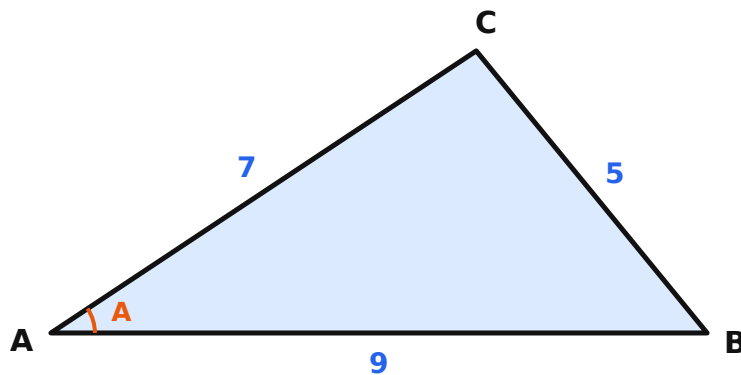
- A. 60 degrees
- B. 90 degrees
- C. 45 degrees
- D. 120 degrees

Question 7

Two angles of a triangle are 40 and 75 degrees and the side opposite the 40 degree angle is 10. What is the first step to find the other sides?

- A. Find the third angle, 65 degrees, and use the Law of Sines
- B. Use the Law of Cosines with 10 and 40
- C. Add the angles to get 115
- D. Use the Pythagorean theorem

Question 8



Given three sides, use the Law of Cosines to find an angle.

A triangle has sides 5, 7 and 9. Which side is opposite the largest angle?

- A. 5
- B. 7
- C. All are equal
- D. 9

Question 9

In the Law of Cosines, what happens when the included angle is 90 degrees?

- A. It gives a negative length
- B. It becomes the Pythagorean theorem
- C. It becomes the Law of Sines
- D. It gives 180 degrees

Question 10

The area of an equilateral triangle with side 6 is $(1/2)(6)(6)\sin 60$. What is it, to the nearest tenth?

- A. 18
- B. 9
- C. 31.2
- D. 15.6

Answers

1. **A** - Area = $\frac{1}{2} \times 8 \times 11 \times \sin 30 = 22$. Forgetting the $\frac{1}{2}$ gives 44 (with $\sin 30 = 0.5$).
2. **C** - Each side over the sine of its opposite angle gives the same ratio.
3. **B** - SAS gives the third side with the Law of Cosines.
4. **A** - $c^2 = 49 + 81 - 2(7)(9)(0.5) = 67$. The value 130 forgets the cosine term.
5. **C** - $b / \sin 90 = 10 / \sin 30$, so $b = 10 / 0.5 = 20$.
6. **B** - $\cos C = (9 + 16 - 25)/24 = 0$, so C is 90 degrees.
7. **A** - AAS: first find the third angle ($180 - 115 = 65$), then use the Law of Sines.
8. **D** - The longest side is opposite the largest angle.
9. **B** - $\cos 90 = 0$, so the last term vanishes and $c^2 = a^2 + b^2$.
10. **D** - $(\frac{1}{2})(36)(0.866) = 15.6$. Using $\sin 60 = 1$ gives 18.

Remember

- Area = $(\frac{1}{2}) ab \sin C$.
- Law of Sines: $a/\sin A = b/\sin B = c/\sin C$.
- Law of Cosines: $c^2 = a^2 + b^2 - 2ab \cos C$.
- AAS or ASA: use sines. SAS or SSS: use cosines.
- When the included angle is 90 degrees the Law of Cosines becomes the Pythagorean theorem.