

Precalculus - Law of Sines and Law of Cosines - Quiz

Common Core G-SRT.D.10, G-SRT.D.11, G-SRT.C.8 · maths-pdf.fr/en/

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

Pick the best answer for 10 questions on the Law of Sines, the Law of Cosines and area. Explanations flag common errors, such as ignoring the second solution.

Precalculus · Common Core State Standards: **G-SRT.D.10, G-SRT.D.11, G-SRT.C.8**

Questions

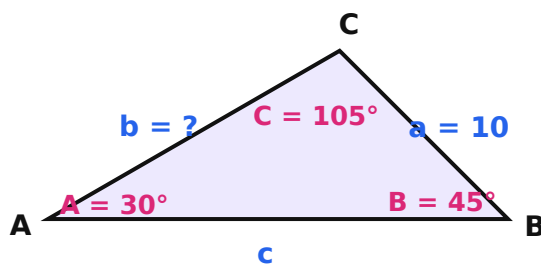
Question 1

Which law do you use when you know two sides and the included angle?

- A. Law of Sines
- B. Pythagorean theorem
- C. Law of Cosines
- D. Heron's formula

Question 2

In the triangle shown, $A = 30^\circ$, $B = 45^\circ$, $a = 10$. What is b ?



Triangle ABC.

- A. $10\sqrt{2}$
- B. $5\sqrt{2}$
- C. 10
- D. 20

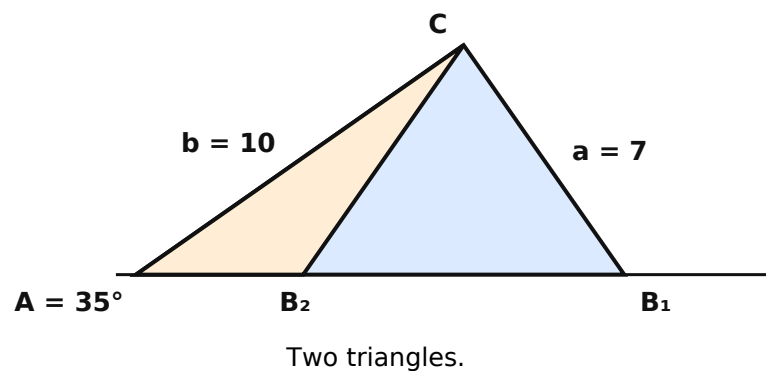
Question 3

For SSA information, $\sin B$ is computed as 1.3. How many triangles exist?

- A. 1
- B. 2
- C. 0
- D. 3

Question 4

The figure shows two triangles from the same data. Which case is this?



- A. The SAS case
- B. The ambiguous case (SSA)
- C. A right triangle only
- D. The SSS case

Question 5

What is the area of a triangle with sides 6 and 8 and included angle 30° ?

- A. 24
- B. $24\sqrt{3}$
- C. 48
- D. 12

Question 6

A triangle has sides 13, 14, 15. What is its area (Heron)?

- A. 42
- B. 168
- C. 210
- D. 84

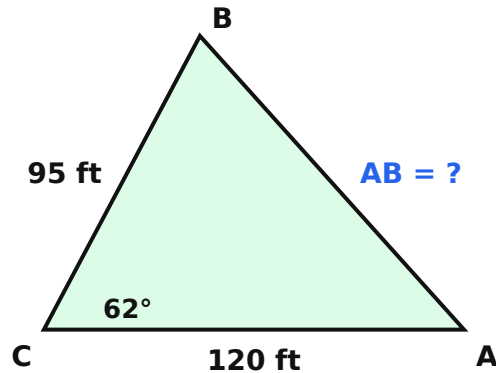
Question 7

Which expression gives c when $a=5$, $b=7$, $C=40^\circ$?

- A. $\sqrt{5^2+7^2-2(5)(7)\cos 40^\circ}$
- B. $\sqrt{5^2+7^2+2(5)(7)\cos 40^\circ}$
- C. $\frac{5\sin 40^\circ}{7}$
- D. $5+7-\cos 40^\circ$

Question 8

A surveyor measures the triangle shown. Which law finds AB ?



Pond triangle.

- A. Law of Cosines
- B. Law of Sines
- C. Right-triangle sine
- D. None; it is impossible

Question 9

In a triangle, which side is opposite the largest angle?

- A. The shortest side
- B. The longest side
- C. The middle side
- D. It depends on the triangle

Question 10

When $C=90^\circ$, the Law of Cosines becomes...

- A. $c^2=a^2-b^2$
- B. $c^2=a^2+b^2$
- C. $c=a+b$
- D. $c^2=2ab$

Answers

1. **C** - SAS has no angle-side pair, so the Law of Cosines is the starting point.
2. **A** - $b = 10 \sin 45 / \sin 30 = 10(\sqrt{2}/2)/(1/2) = 10 \sqrt{2}$.
3. **C** - Sine cannot exceed 1, so no triangle exists.
4. **B** - The side opposite the given angle can reach the base in two places.
5. **D** - Area = $1/2 (6)(8) \sin 30 = 24 \text{ times } 1/2 = 12$.
6. **D** - $s = 21$ and the area is $\sqrt{21 \text{ times } 8 \text{ times } 7 \text{ times } 6} = 84$.
7. **A** - The Law of Cosines subtracts $2ab \cos C$.
8. **A** - Two sides and the included angle are known, so use the Law of Cosines.
9. **B** - The largest angle always faces the longest side.
10. **B** - $\cos 90 = 0$, so the extra term vanishes, leaving the Pythagorean theorem.

Remember

- Law of Sines: $a/\sin A = b/\sin B = c/\sin C$.
- Law of Cosines: $c^2 = a^2 + b^2 - 2ab \cos C$.
- SSA can give 0, 1 or 2 triangles (the ambiguous case).
- Area = $(1/2) a b \sin C$; Heron: $\sqrt{s(s-a)(s-b)(s-c)}$ with $s = (a + b + c)/2$.
- The angles of a triangle add to 180 degrees; the largest angle is opposite the longest side.