LESSON MAKER PRO

Triangle Truth Check

Test side lengths for triangles and right triangles.

GRADE 8 · MA.8.GR.1.3

MA.8.GR.1.3 "Use the Triangle Inequality Theorem to determine if a triangle can be formed from a given set of sides. Use the converse of the Pythagorean Theorem to determine if a right triangle can be formed from a given set of sides."

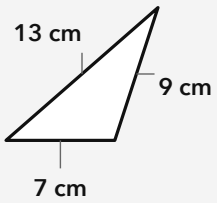
NAME _____ DATE _____

CHECK THE SIDES

A set of three lengths can form a triangle only when the sum of the two shorter lengths is greater than the longest length. If it can form a triangle, square the two shorter lengths and add them. When that sum equals the square of the longest length, the triangle is right.

WORKED EXAMPLE

Use the labeled triangle. Can these side lengths form a triangle? If so, is it a right triangle?

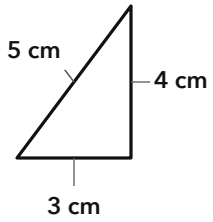


1. $7 + 9 = 16$.
2. $16 > 13$, so a triangle can form.
3. $7^2 + 9^2 = 130$, and $13^2 = 169$.

Answer: Yes, a triangle can form. No, it is not a right triangle.

PRACTICE 6 problems

1 Use the side lengths shown. Can they form a triangle? If so, is it a right triangle?



ANSWER _____

_____

2 Side lengths are 6 cm, 10 cm, and 19 cm. Can they form a triangle? If so, is it a right triangle?

ANSWER _____

_____

3 Side lengths are 8 cm, 15 cm, and 17 cm. Can they form a triangle? If so, is it a right triangle?

ANSWER _____

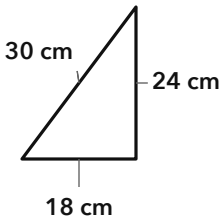
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4 Side lengths are 11 cm, 16 cm, and 20 cm. Can they form a triangle? If so, is it a right triangle?

ANSWER _____

_____

5 Use the side lengths shown. Can they form a triangle? If so, is it a right triangle?



ANSWER _____

_____

6 Side lengths are 14 cm, 22 cm, and 31 cm. Can they form a triangle? If so, is it a right triangle?

ANSWER _____

_____

APPLY IT Show your work

1 For a skate park design, three support bars are 25 cm, 60 cm, and 65 cm long. Can the bars make a triangular support? Would the support be a right triangle?

WORK SPACE

ANSWER _____

2 A student is building a triangular light frame for the school talent show with rods that are 12 cm, 35 cm, and 39 cm long. Can the rods make a triangular frame? Is the frame a right triangle?

WORK SPACE

ANSWER _____

CHALLENGE One step up

A sports club has three whole-number rope lengths: 28 cm, 45 cm, and x cm. The ropes form a right triangle. Find x and explain why x must be the longest side.

WORK SPACE AND ANSWER

ANSWER KEY

Triangle Truth Check

GRADE 8 · MA.8.GR.1.3

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Use the side lengths shown. Can they form a triangle? If so, is it a right triangle?	**Yes, a triangle can form. Yes, it is a right triangle.**
2	Side lengths are 6 cm, 10 cm, and 19 cm. Can they form a triangle? If so, is it a right triangle?	**No, a triangle cannot form. It cannot be a right triangle.**
3	Side lengths are 8 cm, 15 cm, and 17 cm. Can they form a triangle? If so, is it a right triangle?	**Yes, a triangle can form. Yes, it is a right triangle.**
4	Side lengths are 11 cm, 16 cm, and 20 cm. Can they form a triangle? If so, is it a right triangle?	**Yes, a triangle can form. No, it is not a right triangle.**
5	Use the side lengths shown. Can they form a triangle? If so, is it a right triangle?	**Yes, a triangle can form. Yes, it is a right triangle.**
6	Side lengths are 14 cm, 22 cm, and 31 cm. Can they form a triangle? If so, is it a right triangle?	**Yes, a triangle can form. No, it is not a right triangle.**

PART 2 · APPLY IT

1. **Yes, the bars can make a triangle, and it is a right triangle.** $25 + 60 > 65$, so the bars can form a triangle. Also, $25^2 + 60^2 = 4225$ and $65^2 = 4225$.
2. **Yes, the rods can make a triangle. No, the frame is not a right triangle.** $12 + 35 > 39$, so a triangle can form. However, $12^2 + 35^2 = 1369$, while $39^2 = 1521$.

CHALLENGE

$x = 53$ cm. If 45 were the longest side, $x^2 = 45^2 - 28^2 = 1241$, which is not a whole-number square. Therefore x is the longest side, and $28^2 + 45^2 = 53^2$.

Accept correct triangle-inequality comparisons and square-sum comparisons. Units are optional in student answers unless the student includes a measurement.