LESSON MAKER PRO

Triangle Detectives

Use side lengths to uncover a triangle's angles.

GRADE 8 · 8.GR.B.4

8.GR.B.4 "Understand and reason about the Pythagorean Theorem and its extensions. Use diagrams, examples, or informal reasoning to explain the Pythagorean Theorem and why it applies to all right triangles..."

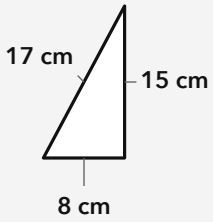
NAME _____ DATE _____

COMPARE THE SQUARES

Find the longest side, c, and call the shorter sides a and b. If $a^2 + b^2$ equals c^2, the triangle is right. If the sum is greater, it is acute; if the sum is less, it is obtuse.

WORKED EXAMPLE

Classify the triangle shown.



1. The longest side is 17 cm.
2. $8^2 + 15^2 = 64 + 225 = 289$.
3. $17^2 = 289$, so the sums are equal.

Answer: Right triangle

PRACTICE 4 problems

1 Do sides 5, 12, and 13 form a right triangle?

ANSWER _____

2 Classify a triangle with sides 6, 9, and 11.

ANSWER _____

3 Classify a triangle with sides 7, 10, and 12.

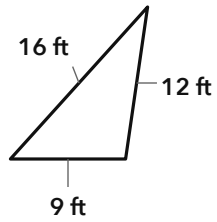
ANSWER _____

4 Do sides 10, 24, and 26 form a right triangle? Show one comparison.

ANSWER _____

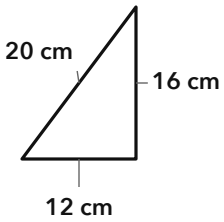
APPLY IT Show your work

1 The supports of a skate ramp make the triangle shown. Is it right, acute, or obtuse? Show a comparison.



ANSWER _____

2 A maker builds a triangular phone stand with the rods shown. Is its frame right, acute, or obtuse? Show a comparison.



ANSWER _____

CHALLENGE One step up

A triangle has sides 7, 24, and x, where x is a whole number from 18 to 26. List every x that makes an obtuse triangle. Explain.

WORK SPACE AND ANSWER

ANSWER KEY

Triangle Detectives

GRADE 8 · 8.GR.B.4

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Do sides 5, 12, and 13 form a right triangle?	**Yes**
2	Classify a triangle with sides 6, 9, and 11.	**Obtuse**
3	Classify a triangle with sides 7, 10, and 12.	**Acute**
4	Do sides 10, 24, and 26 form a right triangle? Show one comparison.	**Yes. $10^2 + 24^2 = 676 = 26^2$.**

PART 2 · APPLY IT

1. **Obtuse** $9^2 + 12^2 = 225$, which is less than $16^2 = 256$.
2. **Right** $12^2 + 16^2 = 400 = 20^2$.

CHALLENGE

18, 19, 20, 21, 22, and 26. For 18 through 22, $7^2 + x^2 < 24^2$. When x = 26, $7^2 + 24^2 < 26^2$. The other values do not make obtuse triangles.

Accept any correct comparison of the square of the longest side with the sum of the squares of the other sides. For the challenge, students must check which side is longest when x changes.