

Square Check

Use side lengths to verify right triangles.

GRADE 8 • 8.MG.4.a

8.MG.4.a "Verify the Pythagorean Theorem using diagrams, concrete materials, and measurement."

NAME _____

DATE _____

CHECK THE SQUARES

Let c be the longest side. A triangle is right when $a^2 + b^2 = c^2$. In a square diagram, the two smaller square areas must add to the largest square area.

WORKED EXAMPLE

Do side lengths 8, 15, and 17 make a right triangle?

1. 17 is the longest side, so $c = 17$.
2. $8^2 + 15^2 = 64 + 225 = 289$.
3. $17^2 = 289$, so the values match.

Answer: Yes, it is a right triangle.

PRACTICE 5 problems

- 1** Measured sides: 3, 4, 5. Verify that the triangle is right.

ANSWER _____

- 2** Measured sides: 7, 24, 25. Is the triangle right?

ANSWER _____

- 3** Measured sides: 20, 21, 29. Is the triangle right?

ANSWER _____

- 4** Measured sides: 10, 11, 14. Is the triangle right?

ANSWER _____

- 5** A right triangle has legs 12 and 16. Find c .

ANSWER _____

APPLY IT Show your work

- 1** A tablet screen is 18 cm wide and 24 cm tall. Its diagonal is labeled 30 cm. Is the label correct?

WORK SPACE

ANSWER _____

- 2** A skateboard ramp rises 7 ft over a horizontal distance of 24 ft. How long is the slanted ramp?

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

A tile diagram shows square areas 81, 144, and 225 on the sides of a triangle. Which side is the hypotenuse, and does the diagram verify a right triangle? Explain.

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Measured sides: 3, 4, 5. Verify that the triangle is right.	$3^2 + 4^2 = 5^2$, so yes.
2	Measured sides: 7, 24, 25. Is the triangle right?	$7^2 + 24^2 = 25^2$, so yes.
3	Measured sides: 20, 21, 29. Is the triangle right?	$20^2 + 21^2 = 29^2$, so yes.
4	Measured sides: 10, 11, 14. Is the triangle right?	$10^2 + 11^2$ does not equal 14^2 , so no.
5	A right triangle has legs 12 and 16. Find c.	$c = 20$

PART 2 • APPLY IT

- Yes, the diagonal is 30 cm.** $18^2 + 24^2 = 324 + 576 = 900$. Since $30^2 = 900$, the label is correct.
- 25 ft** Use the rise and horizontal distance as the legs. $7^2 + 24^2 = 625$, and $\sqrt{625} = 25$.

CHALLENGE

The side with square area 225 is the hypotenuse. Yes, because $81 + 144 = 225$.

Accept equivalent calculations that compare the two smaller squares with the largest square. For non-right triangles, students must identify the longest side before checking.