LESSON MAKER PRO

Right Angle Detective

Test side lengths to find hidden right angles.

HIGH SCHOOL · GDA.GM.J.35.d

GDA.GM.J.35.d "Demonstrate the converse of the Pythagorean Theorem."

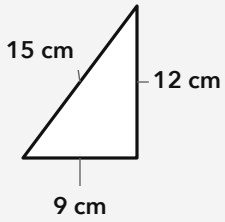
NAME _____ DATE _____

THE CONVERSE TEST

To test a triangle, call its longest side c and its other sides a and b. If $a^2 + b^2 = c^2$, the triangle is a right triangle. If the two sides of the equation are not equal, it is not a right triangle. The sketches are not to scale.

WORKED EXAMPLE

Do the side lengths in the figure form a right triangle?

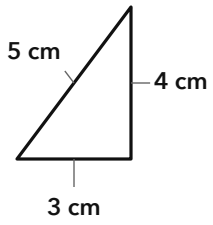


1. The longest side is 15 cm.
2. $9^2 + 12^2 = 81 + 144 = 225$.
3. $15^2 = 225$, so the two sides of the equation are equal.

Answer: Yes, the triangle is a right triangle.

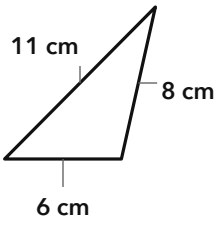
PRACTICE 6 problems

1 Is this a right triangle? Show the squares you compared.



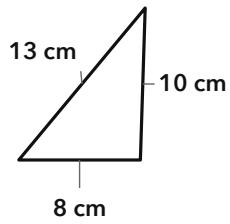
ANSWER _____

2 Is this a right triangle? Show the squares you compared.



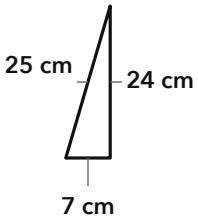
ANSWER _____

3 Is this a right triangle? Show the squares you compared.



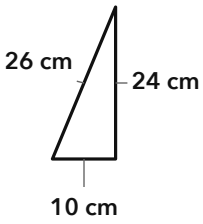
ANSWER _____

4 Is this a right triangle? Show the squares you compared.



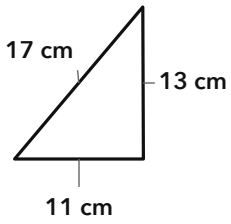
ANSWER _____

5 Is this a right triangle? Show the squares you compared.



ANSWER _____

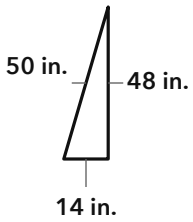
6 Is this a right triangle? Show the squares you compared.



ANSWER _____

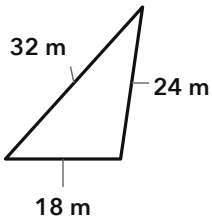
APPLY IT Show your work

1 You are building a triangular support for a makerspace display. Its three edges have the lengths shown. Does the support have a right angle? Show your test.



ANSWER _____

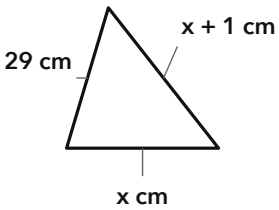
2 Three paths at a skate park connect to form a triangular loop. Their lengths are shown. Does the loop have a right angle? Show your test.



ANSWER _____

CHALLENGE One step up

A triangular bike-park sign has the side lengths shown and a perimeter of 70 cm. Is it a right triangle? Find x and show how you know.



WORK SPACE AND ANSWER

ANSWER KEY # Right Angle Detective

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Is this a right triangle? Show the squares you compared.	**Yes. $3^2 + 4^2 = 9 + 16 = 25 = 5^2$.**
2	Is this a right triangle? Show the squares you compared.	**No. $6^2 + 8^2 = 36 + 64 = 100$, but $11^2 = 121$.**
3	Is this a right triangle? Show the squares you compared.	**No. $8^2 + 10^2 = 64 + 100 = 164$, but $13^2 = 169$.**
4	Is this a right triangle? Show the squares you compared.	**Yes. $7^2 + 24^2 = 49 + 576 = 625 = 25^2$.**
5	Is this a right triangle? Show the squares you compared.	**Yes. $10^2 + 24^2 = 100 + 576 = 676 = 26^2$.**
6	Is this a right triangle? Show the squares you compared.	**No. $11^2 + 13^2 = 121 + 169 = 290$, but $17^2 = 289$.**

PART 2 · APPLY IT

1. **Yes. $14^2 + 48^2 = 196 + 2304 = 2500 = 50^2$.** Compare the sum of the squares of the shorter edges with the square of the longest edge. They are equal, so the support has a right angle.
2. **No. $18^2 + 24^2 = 324 + 576 = 900$, but $32^2 = 1024$.** Compare the sum of the squares of the shorter paths with the square of the longest path. They are not equal, so the loop has no right angle.

CHALLENGE

$x + (x + 1) + 29 = 70$, so $x = 20$. The sides are 20 cm, 21 cm, and 29 cm. Yes, it is a right triangle because $20^2 + 21^2 = 400 + 441 = 841 = 29^2$.

Accept any correct calculation that compares the squares of the two shorter sides with the square of the longest side. Do not accept a conclusion based only on how the sketch looks.