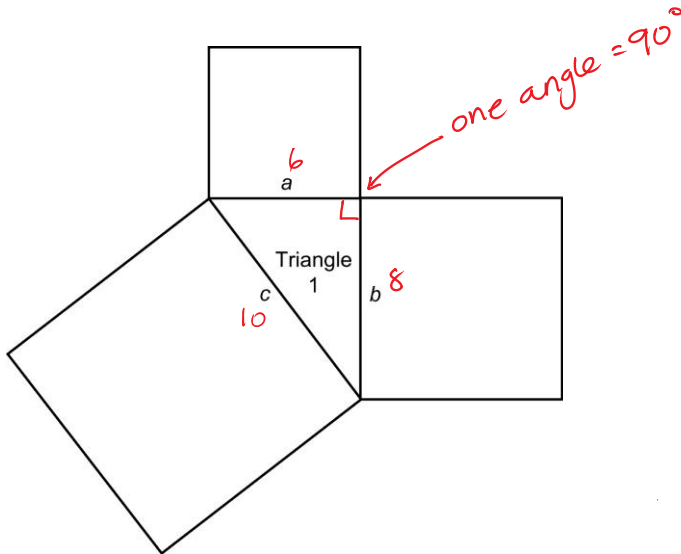


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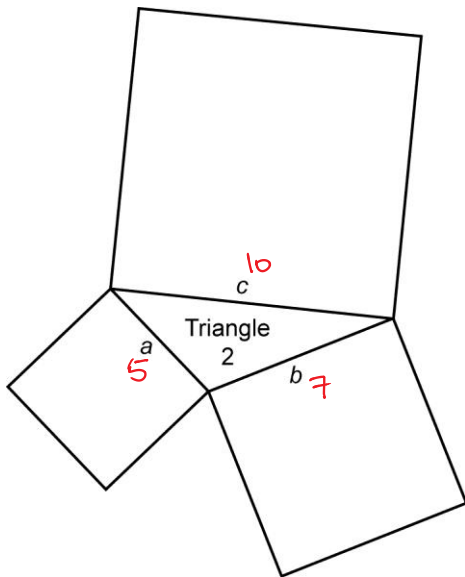
3.2 Notes: Exploring the Pythagorean Relationship



For the right triangle shown, complete the table:

Side	Side Length	Area of Square
a	6	$6 \times 6 = 36$
b	8	$8 \times 8 = 64$
c	10	$10 \times 10 = 100$

$$36 + 64 = 100$$



For the obtuse triangle shown, complete the table:

Side	Side Length	Area of Square
a	5	$5 \times 5 = 25$
b	7	$7 \times 7 = 49$
c	10	$10 \times 10 = 100$

$$25 + 49 \neq 100$$

Vocabulary check:

What is the difference between an acute, obtuse and right triangle?

- acute $\Delta \rightarrow$ angle less than 90° \triangle
- obtuse $\Delta \rightarrow$ angle greater than 90° \triangle
- right $\Delta \rightarrow$ angle is equal 90° \triangle

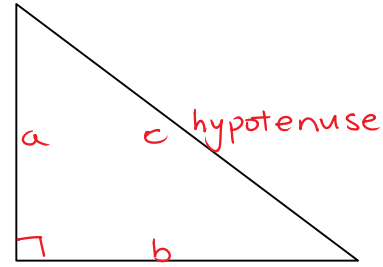
What do you notice about the area of the squares in the right triangle compared to the area of the squares in the obtuse triangle?

For a right triangle, the sum of the two smaller squares is equal to the largest square.

If they are Not equal, it is Not a right triangle.

A right triangle:

- Has one angle that measures: 90°
- The two shorter sides are called:
side a and side b
- The longest side is called the:
side c
or
hypotenuse

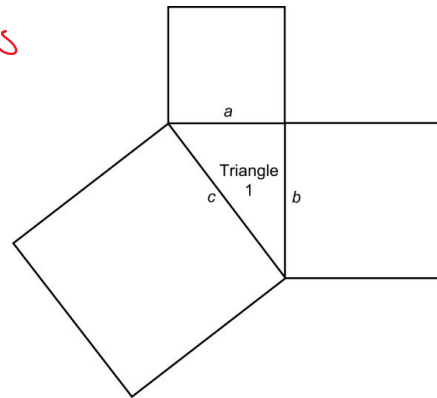


The Pythagorean Relationship states:

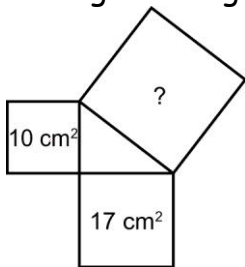
in a right triangle the sum of the areas of the two small squares equals the area of the hypotenuse squared.

$$a^2 + b^2 = c^2$$

If $a^2 + b^2 \neq c^2$, it is not a right triangle.



Find the area of the missing square for the right triangle shown below:



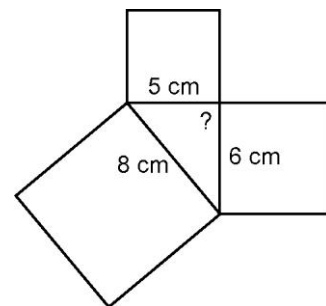
$$a^2 + b^2 = c^2$$

$$10\text{cm}^2 + 17\text{cm}^2 = c^2$$

$$27\text{cm}^2 = c^2$$

The missing area is 27cm^2 .

Is the triangle shown below a right triangle:



Explain your answer:

$$a^2 + b^2 = c^2$$

$$(5\text{cm})^2 + (6\text{cm})^2 \stackrel{?}{=} (8\text{cm})^2$$

$$25\text{cm}^2 + 36\text{cm}^2 \stackrel{?}{=} 64\text{cm}^2$$

$$61\text{cm}^2 \neq 64\text{cm}^2$$

Not a right triangle b/c
 $a^2 + b^2 \neq c^2$.