

Pre Algebra

Aim: What is the relationship between the sides of a right triangle?

Do Now: Find the value of x.

1. $8^2 = x$

$64 = x$

2. $\sqrt{x^2} = \sqrt{16}$

$x = 4$

3. $2^2 + 3^2 = x$

$4 + 9 = x$

$13 = x$

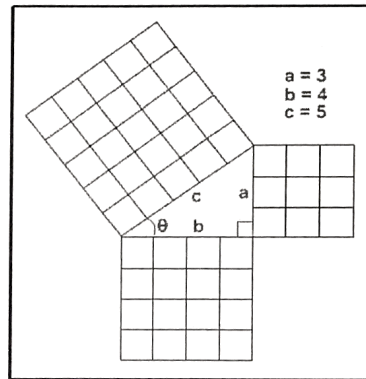
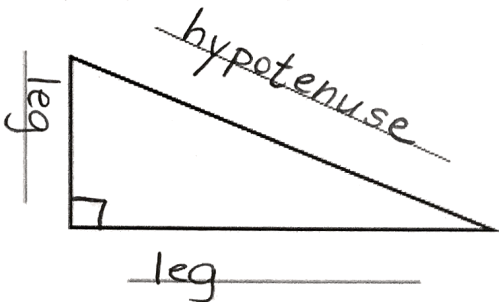
4. $x^2 + 4 = 29$

$x^2 = 25$

$x = 5$

Handwritten note: $(x+5)^2$

In a right triangle, the hypotenuse is the longest side, opposite the right angle. The other two sides are called the legs.



The Pythagorean Theorem

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

Definition:

In right triangles, the square of the length of the hypotenuse is equal to the sum of the squares of the lengths of the legs.

Are these right triangles? Use the Pythagorean Theorem to justify your response.

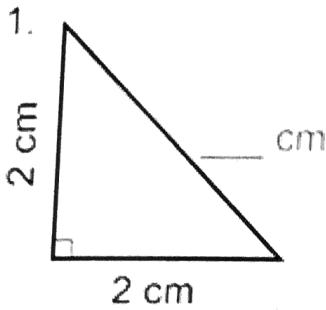
$a^2 + b^2 = c^2$
 $8^2 + 6^2 = 10^2$
 $64 + 36 = 100$
 $100 = 100 \checkmark$

Yes, this is a right triangle

$a^2 + b^2 = c^2$
 $5^2 + 10^2 = 15^2$
 $25 + 100 = 225$
 $125 \neq 225$

Not a right triangle

Find the length of the missing side. Round to the tenth, if necessary.



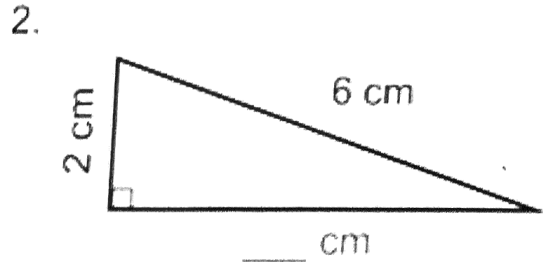
$$a^2 + b^2 = c^2$$

$$2^2 + 2^2 = c^2$$

$$4 + 4 = c^2$$

$$\sqrt{8} = \sqrt{c^2}$$

$$\boxed{2.8 \text{ cm} = c}$$



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

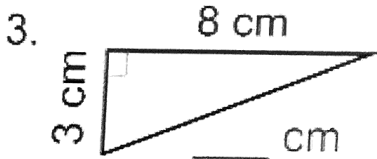
$$a^2 + 2^2 = 6^2$$

$$a^2 + 4 = 36$$

$$\begin{array}{r} 4 \\ -4 \\ \hline \end{array}$$

$$\sqrt{a^2} = \sqrt{32}$$

$$\boxed{a = 5.7 \text{ cm}}$$



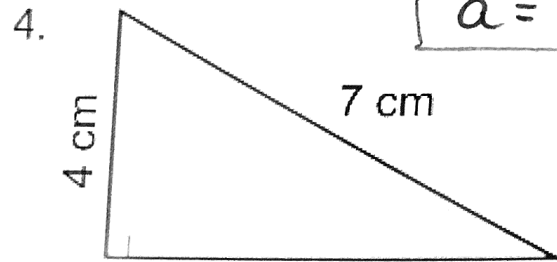
$$a^2 + b^2 = c^2$$

$$3^2 + 8^2 = c^2$$

$$9 + 64 = c^2$$

$$\sqrt{73} = \sqrt{c^2}$$

$$\boxed{8.5 \text{ cm} = c}$$



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

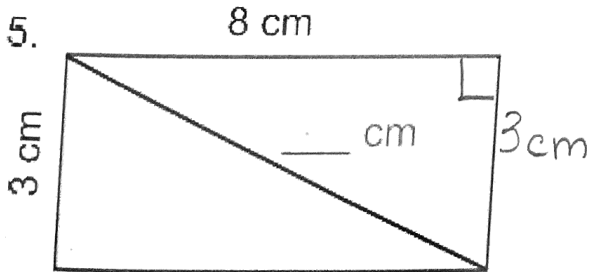
$$a^2 + 4^2 = 7^2$$

$$a^2 + 16 = 49$$

$$\begin{array}{r} 16 \\ -16 \\ \hline \end{array}$$

$$\sqrt{a^2} = \sqrt{33}$$

$$\boxed{a = 5.7 \text{ cm}}$$



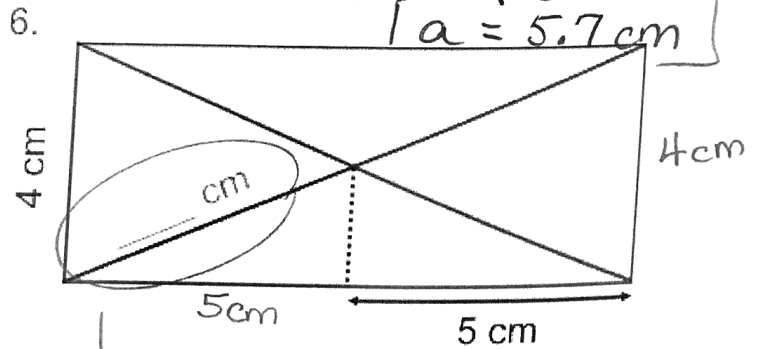
$$a^2 + b^2 = c^2$$

$$3^2 + 8^2 = c^2$$

$$9 + 64 = c^2$$

$$\sqrt{73} = \sqrt{c^2}$$

$$\boxed{8.5 \text{ cm} = c}$$



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

$$4^2 + 10^2 = c^2$$

$$16 + 100 = c^2$$

$$\sqrt{116} = \sqrt{c^2}$$

$$10.8 \text{ cm} = c$$

$$\boxed{10.8 \text{ cm}}$$