Section 7.1 the Pythagorean theorem

History and Discovery

- Pythagoras was a very famous Greek mathematician who lived in the 16th century B.C.

- He and his followers, the Pythagoreans, studied many properties of numbers and geometrical figures

- The most famous discovery made by Pythagoras was the relationship between the side lengths in right triangles

Activity One (Page 206)

- On each geoboard a triangle has been constructed.

- The sides have been labeled a, b, and c where c is the longest side.

- The squares of the sides of each triangle have also been constructed.

- Draw a diagram of each figure on grid paper, and find the area of each square.

- Copy and complete the table.

Inquire (Page 206)

1. Which of the six triangles are right triangles?

2. In each right triangle how does the area of the square on the longest side compared to the sum of the areas of the triangles on the two other sides?

3. Is the relationship you found in question 2 true for triangles that are not right triangles?

a^2 + b^2 = c^2

a

c

b

9

3 5

4

25

16
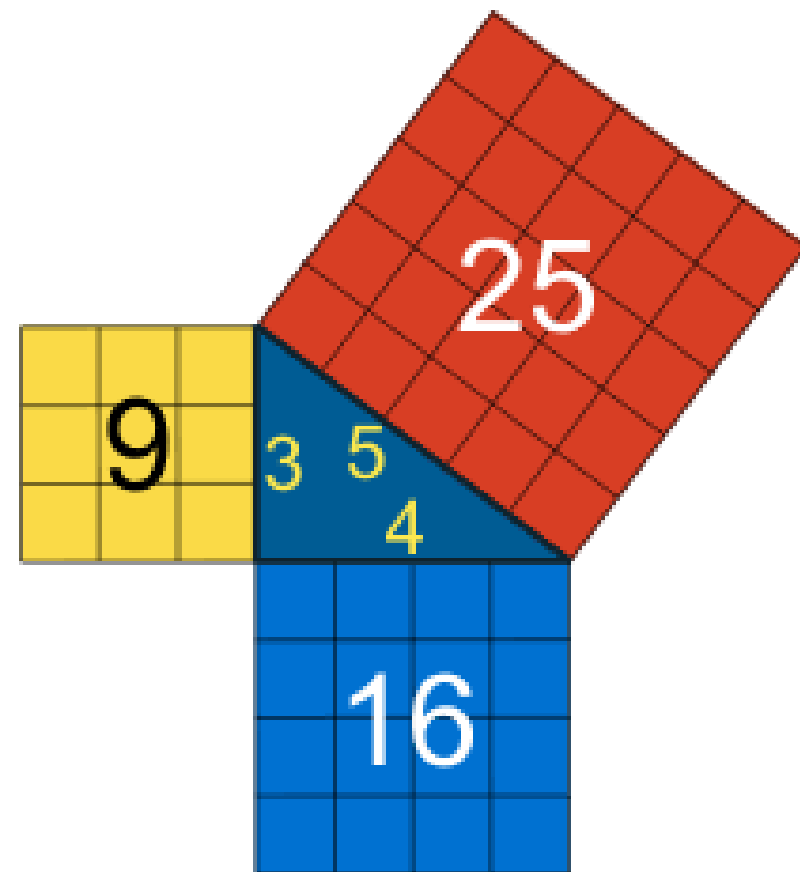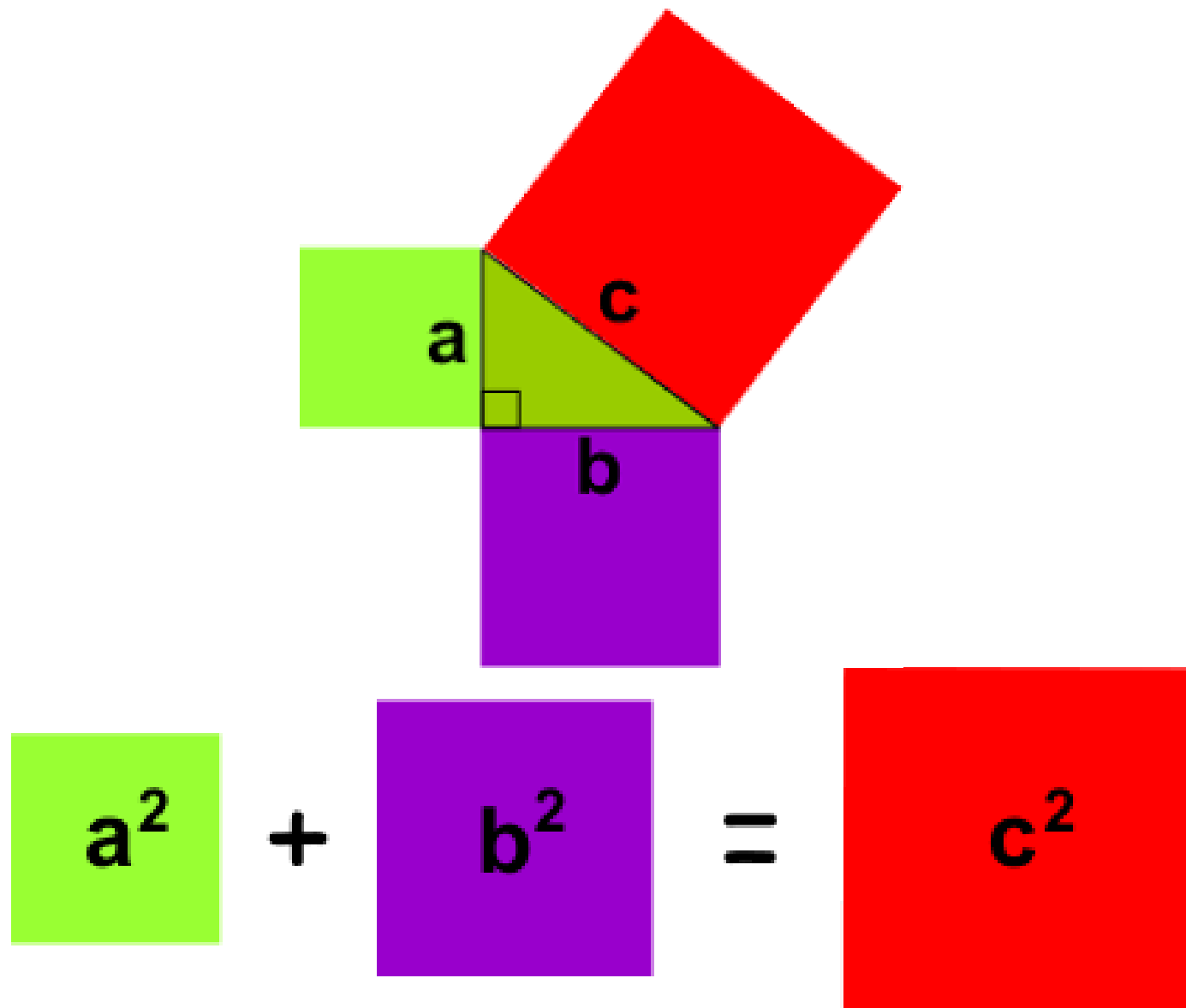
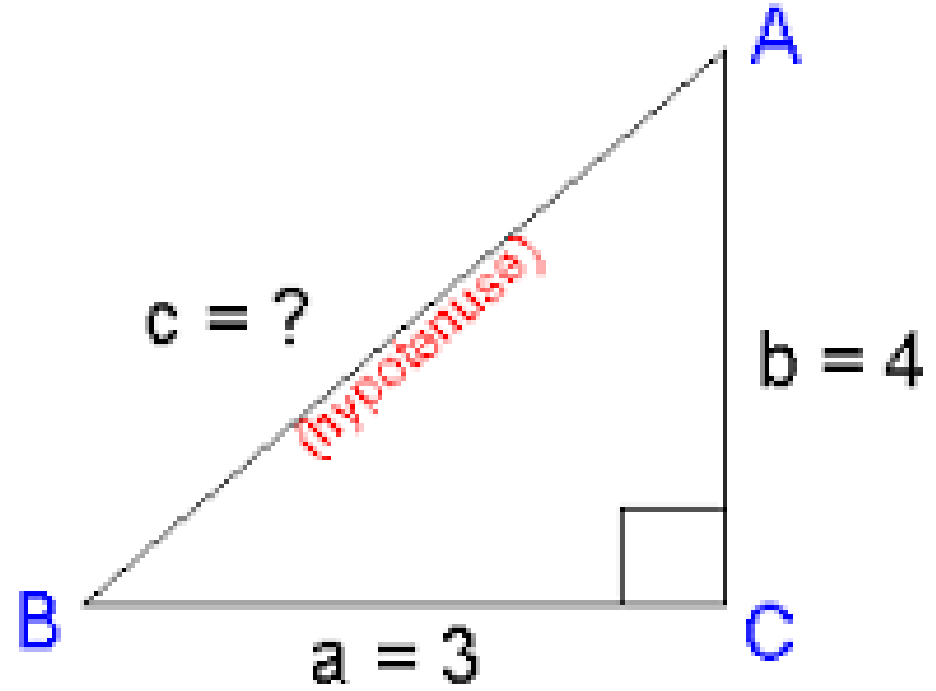- Remember the formula
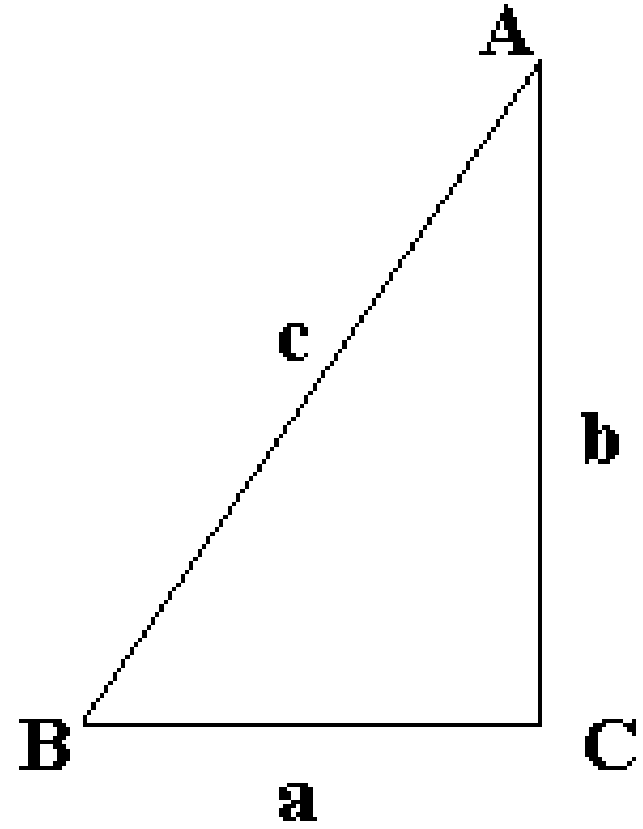
$$a^2 + b^2 = c^2$$
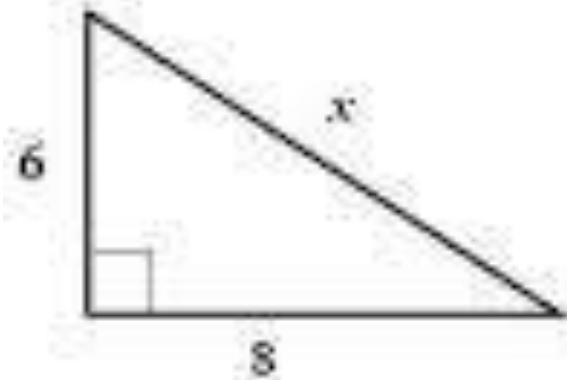
examples

- **<u>calculate the length</u>** of the unknown side if necessary **<u>round to the nearest tenth</u>**
  - How many decimal places is the tenth place?

examples

$$c = ?$$

(hypotenuse)

$$b = 4$$

$$a = 3$$

$$a^2 + b^2 = c^2$$
$$3^2 + 4^2 = c^2$$
$$9 + 16 = c^2$$
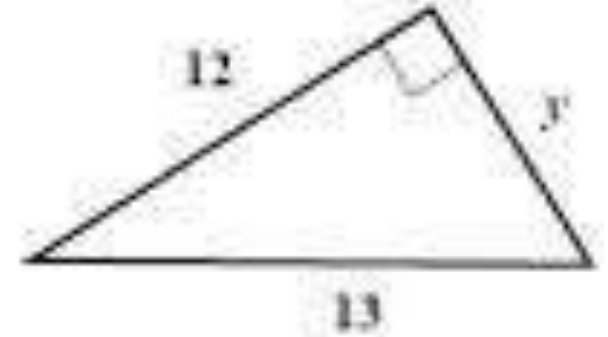$$\sqrt{25} = c$$
$$c = 5$$

Examples

$$6^2 + 8^2 = x^2$$
$$36 + 64 = x^2$$
$$100 = x^2$$
$$\sqrt{100} = \sqrt{x^2}$$
$$\boxed{x = 10}$$

$$12^2 + y^2 = 13^2$$
$$144 + y^2 = 169$$
$$y^2 = 25$$
$$\sqrt{y^2} = \sqrt{25}$$
$$\boxed{y = 5}$$

Practice

- Please complete number 1 to 10 on page 207