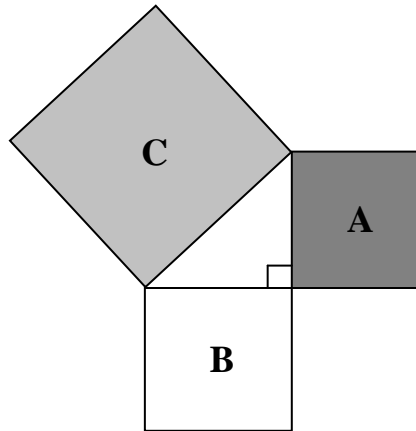


**Worksheet 2-12: Pythagorean Theorem for Right Triangles****Fill in the Blanks:****Right Triangle****Right Angle****Hypotenuse****Legs** (of a right triangle)

1. \_\_\_\_\_ is an angle that measures  $90^\circ$ .
2. \_\_\_\_\_ are the two sides that form a right angle.
3. \_\_\_\_\_ is the longest side of a right triangle (or the side opposite to the right angle).
4. \_\_\_\_\_ is a triangle containing a  $90^\circ$  angle.

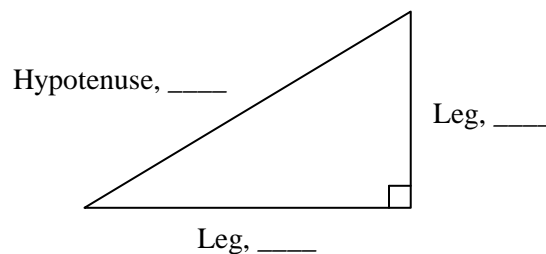
**The Pythagorean Relation:**

For any right triangle, the area of a square placed on the longest side (hypotenuse) of the triangle is equal to the sum of the areas of the squares on the other two sides (legs).



If  $c$  is the measure of the hypotenuse of a right triangle, then  $a$  and  $b$  are the measures of the legs, then

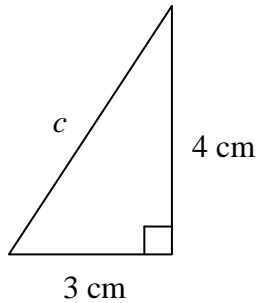
$$c^2 = a^2 + b^2$$

**Please note:**

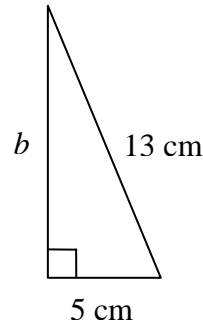
If  $c$  is the measure of the hypotenuse of a right triangle, and  $a$  and  $b$  are the measures of the other two sides (legs), but  $c^2 \neq a^2 + b^2$ , then the triangle is not a right triangle.

1. For the following right triangles,  
 (a) identify the hypotenuse.  
 (b) write the Pythagorean theorem.  
 (c) find the measure of the unknown side, accurate to 2 decimal places

(i)



(ii)



2. Determine whether the given side measures could form a right triangle.

(a) 12, 16, 20

(b) 2, 3, 4

(c) 2, 8, 8

**Answers:** 1. (i) (a)  $c$ , (b)  $c^2 = 3^2 + 4^2$ , (c) 5 cm (reject  $-5$ ), (ii) (a) 13 cm, (b)  $13^2 = 5^2 + b^2$ , (c) 12 cm (reject  $-12$ );  
 2. (a) Yes,  $12^2 + 16^2 = 20^2$ , (b) No,  $2^2 + 3^2 = 13 \neq 4^2$ , (c) No, it is an isosceles triangle.  $2^2 + 8^2 = 68 \neq 8^2$ .

- Answers:** 3. 4.5 m; 4. 2.9 m; 5. Mr. Scherer walks a shorter distance by 43 m.  $[(101+59)-117]$