NAME _____ DATE _____

Activity Lesson Opener
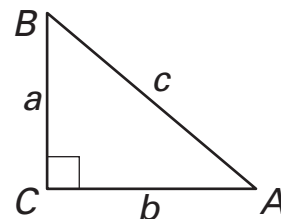
For use with pages 535–541

SET UP: Work with a partner.

Half of a proof of the Pythagorean Theorem is shown. Below that, the remaining five statements of the proof are given out of order. Complete the proof by writing the other statements in order with a reason for each.

Pythagorean Theorem: In a right triangle, the square of the length of the hypotenuse is equal to the sum of the squares of the lengths of the legs.

Given: In $\triangle ABC$, $\angle BCA$ is a right angle.
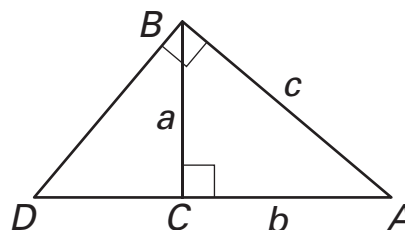
Prove: $a^2 + b^2 = c^2$

1. Extend $\overline{AC}$ to D such that $\angle DBA$ is a right angle.

2. $\dfrac{b}{a} = \dfrac{a}{DC}$ (Geometric Mean Theorem)

3. $DC = \dfrac{a^2}{b}$ (Cross product prop.; multiplication prop. of equality)

4. $\triangle BCD \sim \triangle ACB$ (An altitude to the hyp. of a rt. $\triangle$ divides the $\triangle$ into 2 similar $\triangle$s.)

5. $\dfrac{DB}{BA} = \dfrac{DC}{BC}$ (Ratios of lengths of corresponding sides of similar triangles are equal.)

Area of $\triangle BCD$ + Area of $\triangle BCA$ = Area of $\triangle DBA$	
$DB = \dfrac{ac}{b}$	$a^2 + b^2 = c^2$
$\dfrac{1}{2} \cdot a \cdot \dfrac{a^2}{b} + \dfrac{1}{2} \cdot a \cdot b = \dfrac{1}{2} \cdot \dfrac{ac}{b} \cdot c$	$\dfrac{DB}{c} = \dfrac{\dfrac{a^2}{b}}{a}$