11.3 The Pythagorean Theorem

THM: The Pythagorean Theorem page 712
If a Right triangle has legs of length $a$ and $b$ and its hypotenuse has length $c$, then $a^2 + b^2 = c^2$

See Figure 11.14 page 713
The sum of the areas of the squares on the legs of a right triangle is equal to the area of the square on the hypotenuse.

See Figure 11.16 page 713
Note how 4 right triangles leave one square of area $c^2$ uncovered.

Example 1: Find the missing side $y$. 

\[ \begin{align*}
\text{A} & \quad 52 \\
\text{B} & \quad 52 \\
\text{C} & \quad 52 \\
\text{D} & \quad 65 \\
y & \quad y
\end{align*} \]
11.3 The Pythagorean Theorem

**THM: Converse of the Pythagorean Theorem page 801**
Let a triangle have sides of length $a$, $b$, and $c$. If $a^2 + b^2 = c^2$, then the triangle is a right triangle and the angle opposite the side of length $c$ is its right angle.

Example 2: Checking for Right Triangles

? Which side will be the longest?
? Larger angle corresponds to largest side.

1) 15; 17; 8

2) 231; 520; 568

Example 3:
A baseball diamond is actually a square 90 feet on a side. What distance must a catcher throw the ball to pick off a runner attempting to steal second base?