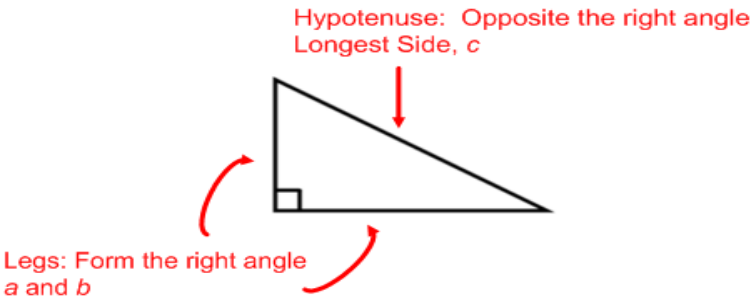
Name: _____ Date: _____

Notes

Algebra Section 11.4

Pages 737-742

## Anatomy of a Right Triangle

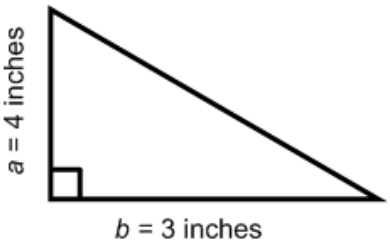



**Pythagorean Theorem: If the triangle is a right triangle, then the sum of the squares of the lengths of the legs is equal to the hypotenuse squared.**

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

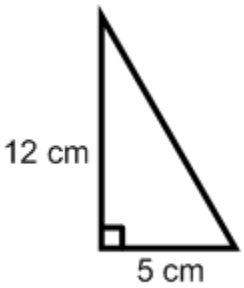
**Use the Pythagorean Theorem to find the missing length:**

**Ex:**



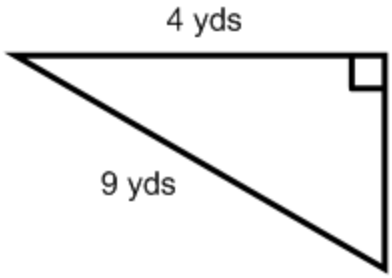

$a^2 + b^2 = c^2$
$4^2 + 3^2 = c^2$
$16 + 9 = c^2$
$25 = c^2$
$5 = c$

**Ex:**



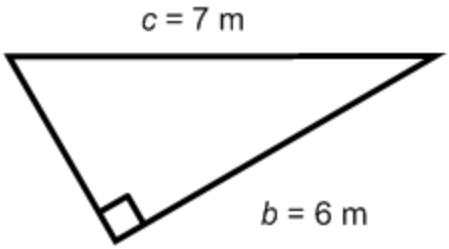

$a^2 + b^2 = c^2$
$12^2 + 5^2 = c^2$
$144 + 25 = c^2$
$169 = c^2$
$13 = c$

**Ex:**




$a^2 + b^2 = c^2$
$4^2 + b^2 = 9^2$
$16 + b^2 = 81$
$-16 \quad -16$
$b^2 = 65$
$b = 8.06$ yards

**Ex:**

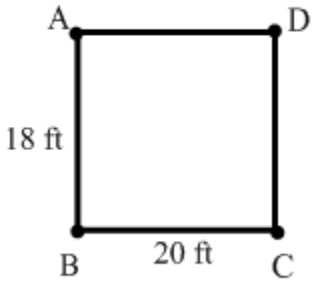



$a^2 + b^2 = c^2$
$a^2 + 6^2 = 7^2$
$a^2 + 36 = 49$
$-36 \quad -36$
$a^2 = 13$
$a = 3.61$ m

**Ex:** Four people standing in a rectangle are playing Frisbee. Approximately how far is the throw from person A to person C?

$a^2 + b^2 = c^2$
$20^2 + 18^2 = c^2$
$400 + 324 = c^2$
$724 = c^2$
$26.91 = c$

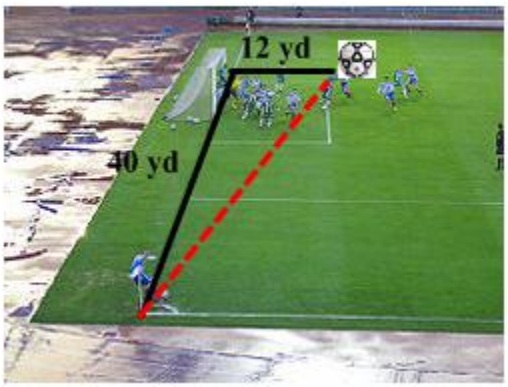
Approximately 27 feet




**Ex:** A soccer player makes a corner kick to another player as shown below. How far is the kick, to the nearest yard?

$a^2 + b^2 = c^2$
$40^2 + 12^2 = c^2$
$1600 + 144 = c^2$
$1744 = c^2$
$41.76 = c$

Approximately 42 yards



**CONVERSE OF THE PYTHAGOREAN THEOREM:**

**If a triangle has side lengths a, b, c such that $a^2 + b^2 = c^2$, then the triangle is a right triangle.**

- **If the Pythagorean Theorem works, then it's a right triangle. If not, then it's not.**

**Tell whether the following side lengths could form a right triangle. Show or explain your work.**

**Ex:** 8, 15, 17

$a^2 + b^2 = c^2$
$8^2 + 15^2 = 17^2$
$64 + 225 = 289$
$289 = 289$

Yes

**Ex:** 5, 9, 8

$a^2 + b^2 = c^2$
$5^2 + 8^2 = 9^2$
$25 + 64 = 81$
$89 = 81$

No

**Ex:** 13, 12, 5

$a^2 + b^2 = c^2$
$5^2 + 12^2 = 13^2$
$25 + 144 = 169$
$169 = 169$

Yes