

**TITLE**

**Application of The Pythagorean Theorem**

**Cube Fellow:** Amy Heilman

**Teacher Mentor:** Katrina Easterling

**Goal:** To learn how to apply the Pythagorean theorem to real-world situations.

**Grade and Course:** 8<sup>th</sup> grade - Algebra

**KY Standards:** MA-08-2.1.6 Students will apply the Pythagorean theorem to determine the length of a hypotenuse.

**Objectives:**

1. Students will be able to recognize when the Pythagorean theorem can be applied to a real-world word problem.
2. Students will be able to use the Pythagorean theorem to solve for unknown variables in real-world problems.

**Resources/materials needed:**

1. Handouts
2. calculators

**Description of Plan**

1. Students will enter class and immediately begin working on a warm up the reviews the fundamental ideas of the Pythagorean theorem.
2. We will collect any homework and answer any questions.
3. Next, the students will each receive a copy of the handout with both word problems on it.
4. As a class, we will work through the first problem.
5. Individually, students will work through the second problem on their own. We will then check our answers as a class and answer any questions.

**Lesson Source:**

- Prentice Hall Geometry Text book

**Instructional Mode:** Teacher lead example, individual work

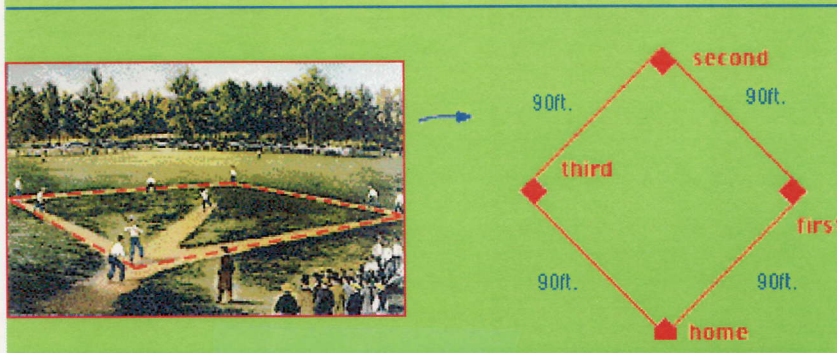
**Date Given:** 11/9/06

**Estimated Time:** 45-50minutes

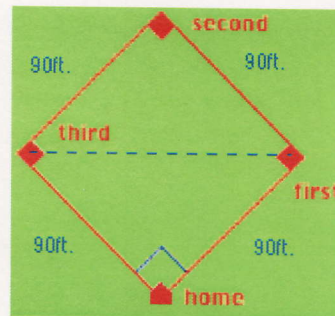
**Date Submitted to Algebra<sup>3</sup>:** 10/9/07

## The Pythagorean Theorem and Baseball

You've just picked up a ground ball at first base, and you see the other team's player running towards third base. How far do you have to throw the ball to get it from first base to third base, and throw the runner out?



A baseball diamond is actually a square, with right angles at each base. Draw a line from first base to third base. You've created a right triangle with that line as the hypotenuse. Since you know the length of the other two sides of the triangle, use the Pythagorean theorem to find the length of the hypotenuse:  $(90)^2 + (90)^2 = c^2$



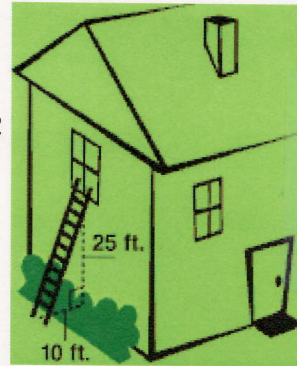
You need to throw the ball 127.3 feet to get it from first base to third base.

## The Pythagorean Theorem and Ladders

You're locked out of your house and the only open window is on the second floor, 25 feet above the ground. You need to borrow a ladder from one of your neighbors. There's a bush along the edge of the house, so you'll have to place the ladder 10 feet from the house. What length of ladder do you need to reach the window?



Think of the ladder as the hypotenuse of a right triangle. Since you know the length of the other two sides of the triangle, use the Pythagorean theorem to find the length of the hypotenuse:  $(10)^2 + (25)^2 = c^2$



You need a ladder that's 27 feet long.