Math Virtual Learning

Pre-Algebra

Pythagorean Theorem

May 22, 2020

Grade 7/Pythagorean Theorem
Lesson: May 22, 2020

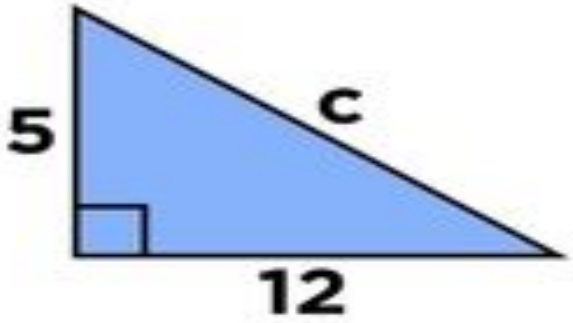
Objective/Learning Target:
Use pythagorean theorem to solve problems.

Let's Get Started:
Watch Video: Review

The Pythagorean Theorem

Given two sides, we can calculate the third.

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



Practice:

A rectangular field has a length of 100 yards and a width of 33 yards. About how far is it from one corner of the field to the opposite corner of the field? Round your answer to the nearest tenth.

Understand the Problem

Rewrite the question as a statement.

- Find the distance from one corner of the field to the opposite corner of the field.

List the **important information:**

- Drawing a segment from one corner of the field to the opposite corner of the field divides the field into two right triangles.
  - The segment between the two corners is the hypotenuse.
- The sides of the fields are legs, and they are 33 yards long and 100 yards long.

Answer Key:

Check It Out!

Solve

$a^2 + b^2 = c^2$ *Use the Pythagorean Theorem.*

$33^2 + 100^2 = c^2$ *Substitute for the known variables.*

$1089 + 10{,}000 = c^2$ *Evaluate the powers.*

$11{,}089 = c^2$ *Add.*

$105.304 \approx c$ *Take the square roots of both sides.*

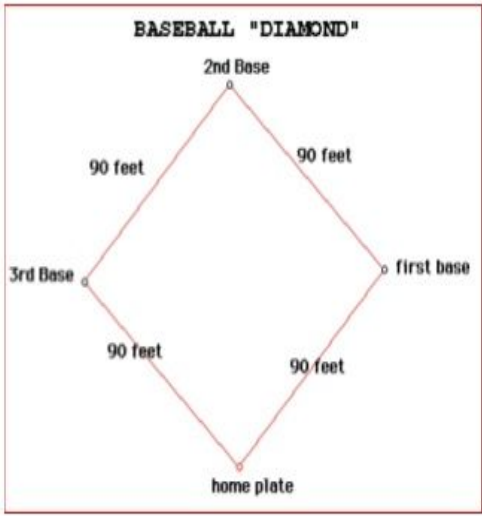
$105.3 \approx c$ *Round.*

The distance from one corner of the field to the opposite corner is about 105.3 yards.

Practice:

Baseball Problem

The distance between consecutive bases is 90 feet. How far does a catcher have to throw the ball from home plate to second base?



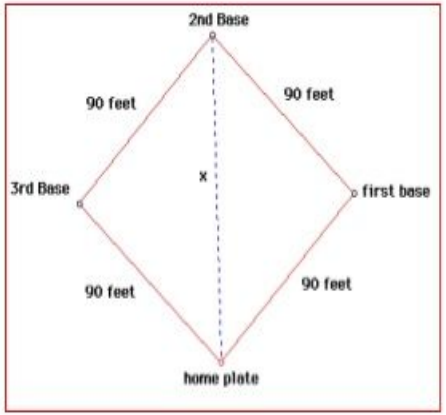
Baseball Problem

To use the Pythagorean theorem to solve for x, find the right angle.

Which side is the hypotenuse?

Which sides are the legs?

Now use: $a^2 + b^2 = c^2$



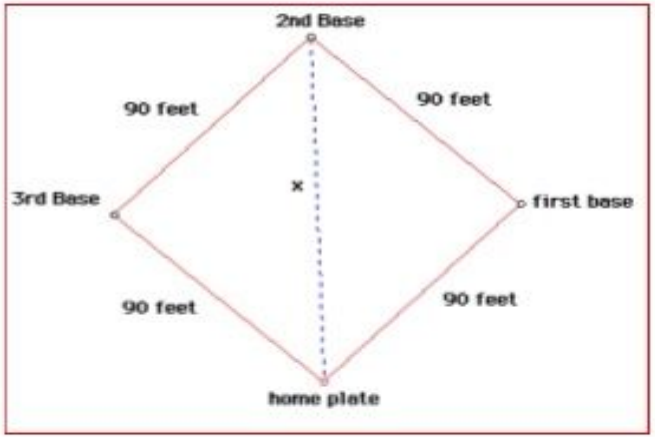
Answer Key:

Baseball Problem
Solution

- The hypotenuse is the distance from home to second, or side x in the picture.
- The legs are from home to first and from first to second.
- Solution:

  $x^2 = 90^2 + 90^2 = 16{,}200$

  $x = 127.28$ ft



Practice:

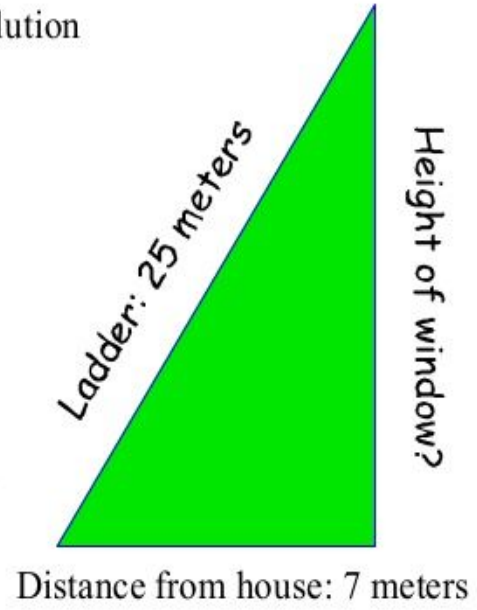
Ladder Problem

A ladder leans against a second-story window of a house.
If the ladder is 25 meters long,
and the base of the ladder is 7 meters from the house,
how high is the window?

Ladder Problem

Solution

- First draw a diagram that shows the sides of the right triangle.
- Label the sides:
  - Ladder is 25 m
  - Distance from house is 7 m
- Use $a^2 + b^2 = c^2$ to solve for the missing side.



Answer Key:

Ladder Problem

Solution

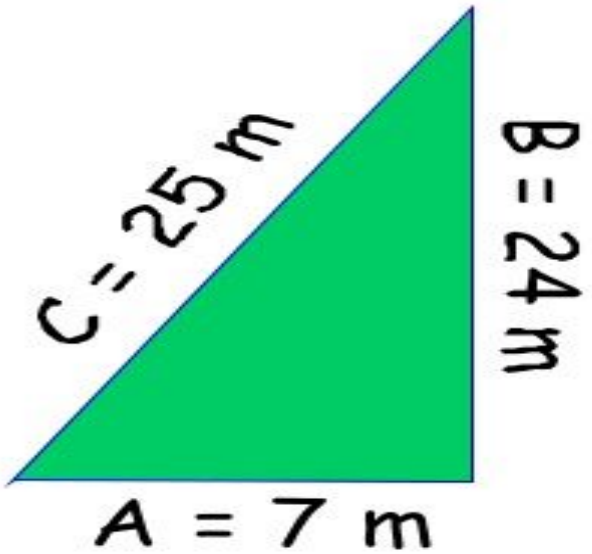
$7^2 + b^2 = 25^2$

$49 + b^2 = 625$

$b^2 = 576$

$b = 24$ m

How did you do?



Additional Practice:

Click on the links below to get additional practice and to check your understanding!

Khan Academy - Practice

Quizizz - Practice

IXL - Practice