Created by Mr. Lischwe

# Warmup 2/(The 2nd perfect number)

***Get a calculator. Yellow or blue – doesn't matter***

**Think of at least 2 "create a date" problems (see warmup sheet)**

# Go over homework

**1) ABCDEFGHIJKLMNOPQRSTUVWXYZ**

**2) H, I, N, O, S, X, Z**

**3) O, X**

**4) A, H, I, M, O, T, U, V, W, X, Y**

**5) B, C, D, E, H, I, K, O, X**

**6) M → W, b → q, d → p, u → n**

# Go over homework

**7) Some examples:**

- **BED**
- **HIKE**
- **CHECKBOOK**
- **EXCEEDED**
- **KICKBOXED**

**8) Some examples:**

- **TOT, WOW, MOM, YAY**

**9) Some examples:**

- **NOON**
- **SIS**
- **MOW**
- **pod**
- **suns**
- **swims**
- **ipod!**

# Angles Quiz Retake deadline…

- Is Tuesday!!!
- You should turn corrections in by Monday

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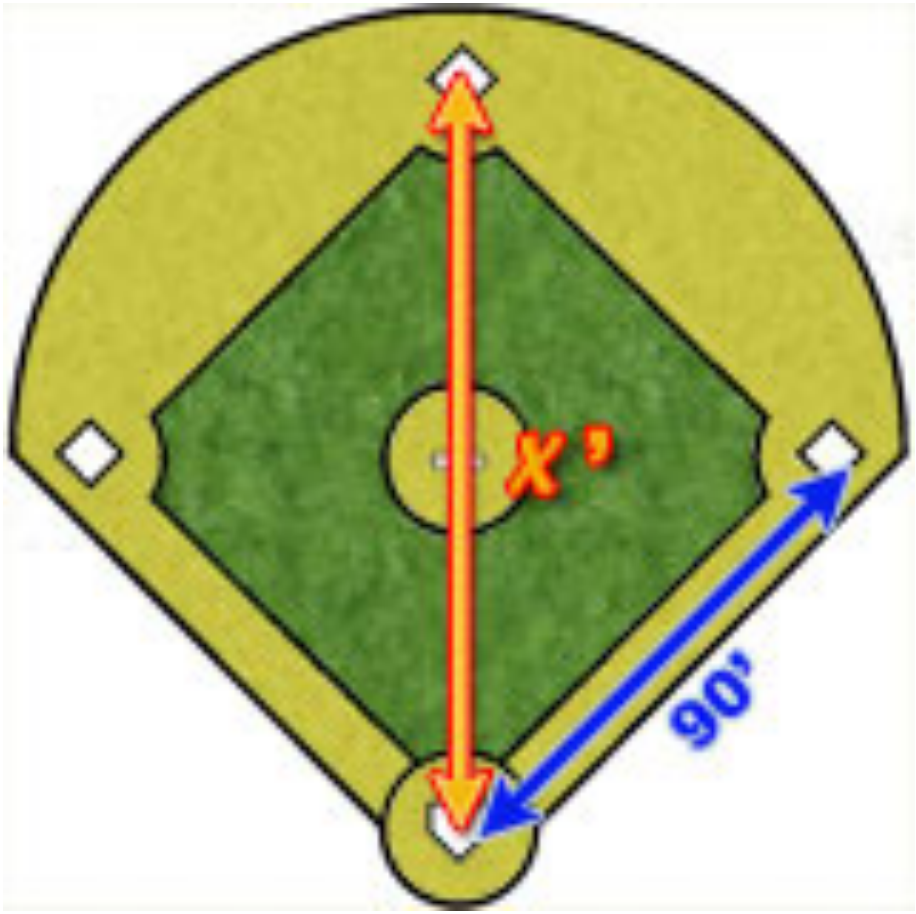
# Pythagorean Theorem



## Objective:

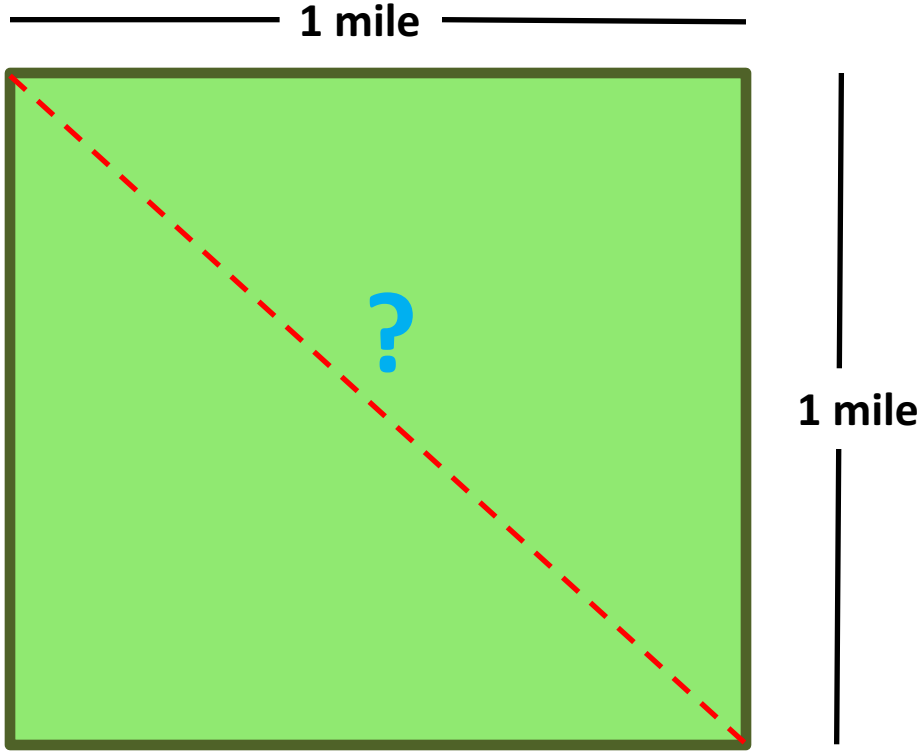
- Use the Pythagorean Theorem to find sides of a right triangle

Estimate how many feet are between home plate and second base on a baseball field. The bases are 90 feet apart.



# Question:

- If you walk from corner to corner of a field that is exactly 1 mile by 1 mile, how many miles did you walk?



# Question:

- Why is something to the second power called “squared”? (There is an actual reason, besides “They just randomly decided to use that word.”)

# Video

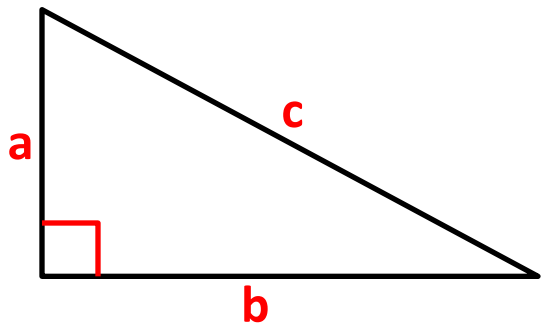
- You are going to watch a video: https://www.youtube.com/watch?v=CAkMUdeB06o

- After the video, we will discuss what is happening in it!

# PYTHAGOREAN THEOREM

- In a right triangle,

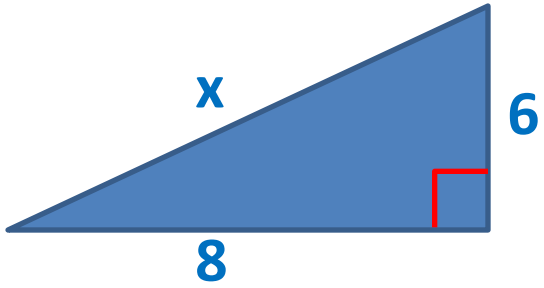
$$a^2 + b^2 = c^2$$




- **a** and **b** are the **legs** (the two sides connected to the right angle)
- **c** is the **hypotenuse** (the longest side, always across from the right angle)

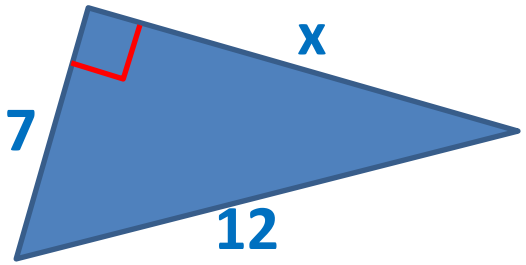
**NOTE:** It doesn't matter which leg is **a** and which is **b**; you will get the same answer either way)

# Example 1: Finding the Hypotenuse




- $a^2 + b^2 = c^2$ — **Write the equation.**
- $8^2 + 6^2 = x^2$ — **Substitute in the side lengths.**
- $64 + 36 = x^2$ — **Square the numbers.**
- $100 = x^2$ — **Add.**
- $\sqrt{100} = x$ — **Square root both sides. (Think: what times itself equals 100?)**
- $10 = x$ — **The missing side length is 10. Now LOOK BACK at your triangle to make sure your answer is reasonable!**

# Example 2: Finding a Leg




- $a^2 + b^2 = c^2$ — Write the equation.
- $7^2 + x^2 = 12^2$ — Substitute in the side lengths.
- $49 + x^2 = 144$ — Square the numbers.
- $x^2 = 95$ — Subtract 49 from both sides.
- $x = \sqrt{95}$ (Exact) — Square root both sides. (Think: what times itself equals 95? This one will be a decimal, so use a calculator)
- $x \approx 9.7$ (Rounded) — You can round your answer to the nearest tenth. Now LOOK BACK at your triangle to make sure your answer is reasonable!

# Unless I tell you otherwise…

- I would like you to round to the nearest **tenth.** This is to help you see if your answer is reasonable.

- However, if I ask for an “exact” answer, this means you should leave it as a square root.

# IMPORTANT NOTE

- It is very easy to remember "$a^2 + b^2 = c^2$." But remembering this is **<u>meaningless</u>** unless you remember what **a**, **b**, and **c** are and when this equation is used.

- This equation is **ONLY USED IN RIGHT TRIANGLES.**
- **a** and **b** are the lengths of the two legs. **c** is the length of the hypotenuse.

Three strategies to catch mistakes:

1. **MAKE SURE YOUR ANSWER IS REASONABLE.**
2. **MAKE SURE YOUR ANSWER IS REASONABLE.**
3. **MAKE SURE YOUR ANSWER IS REASONABLE.**

# For this section…

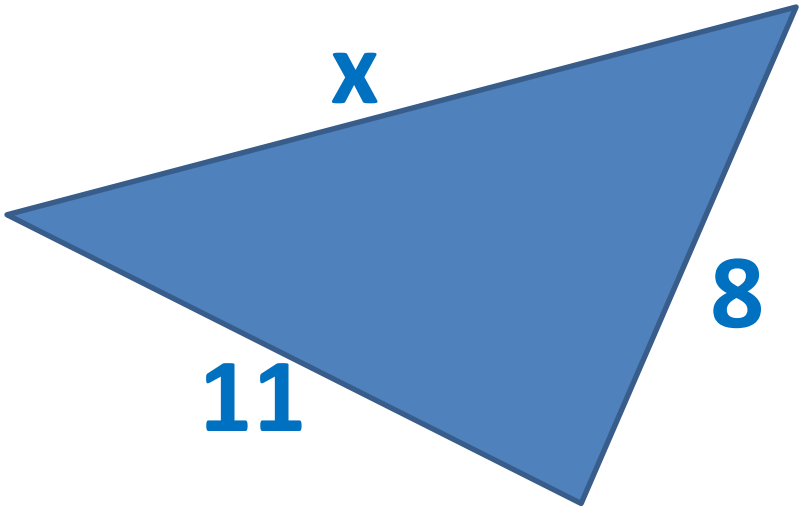
- We **WILL** be using calculators.

Calculator Expectations:

- If you have your own, you should bring it.
- You may use yellow OR blue, but be aware that you won't be able to use the yellow ones during TNReady
- You may not use the calculator on your phone. (During class or PLT)
- ALWAYS PUT THE CALCULATOR BACK!!! Check the numbers!!!

# Example 3

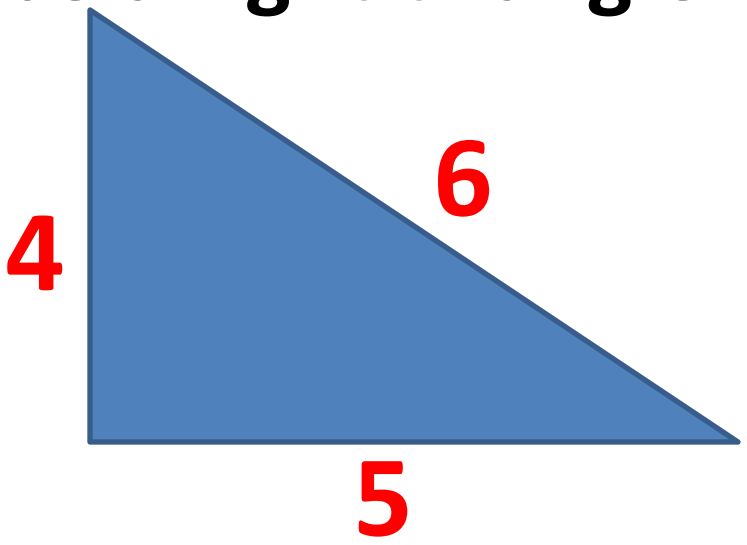
**Discuss with your group how to solve this problem. Estimate what you think the length of the third side would be.**




**Trick question – you don't know it's a right triangle!!!**

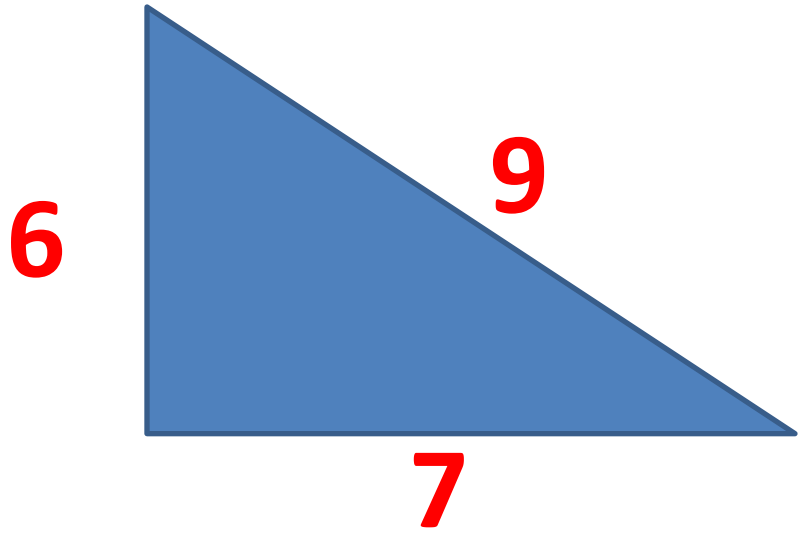
# Question:

**Would this be a right triangle?**




**Nope: $4^2 + 5^2 \neq 6^2$**

# Example 3: Is it a Right Triangle?




- **Set up:** $6^2 + 7^2 = 9^2$

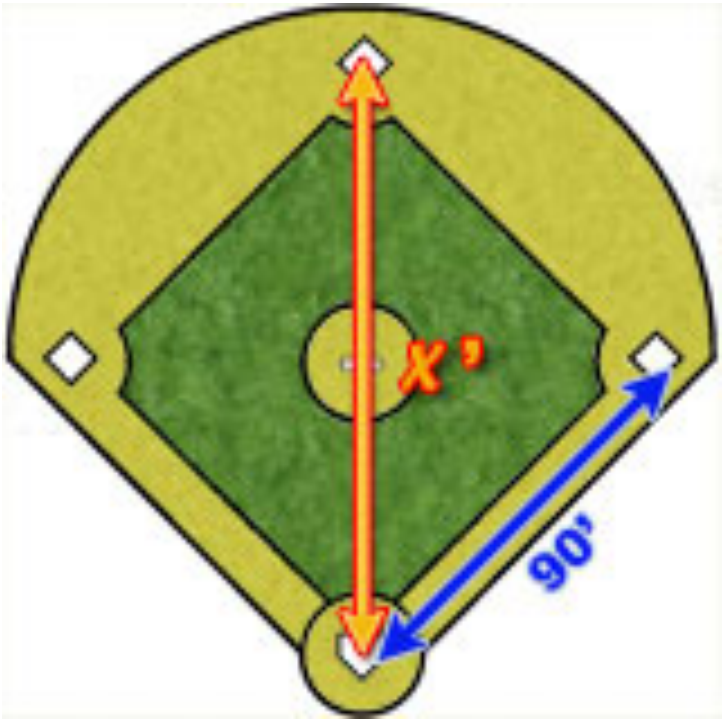
  **36 + 49 = 81**

  **85 = 81**

  **NOT TRUE! Not a right triangle**

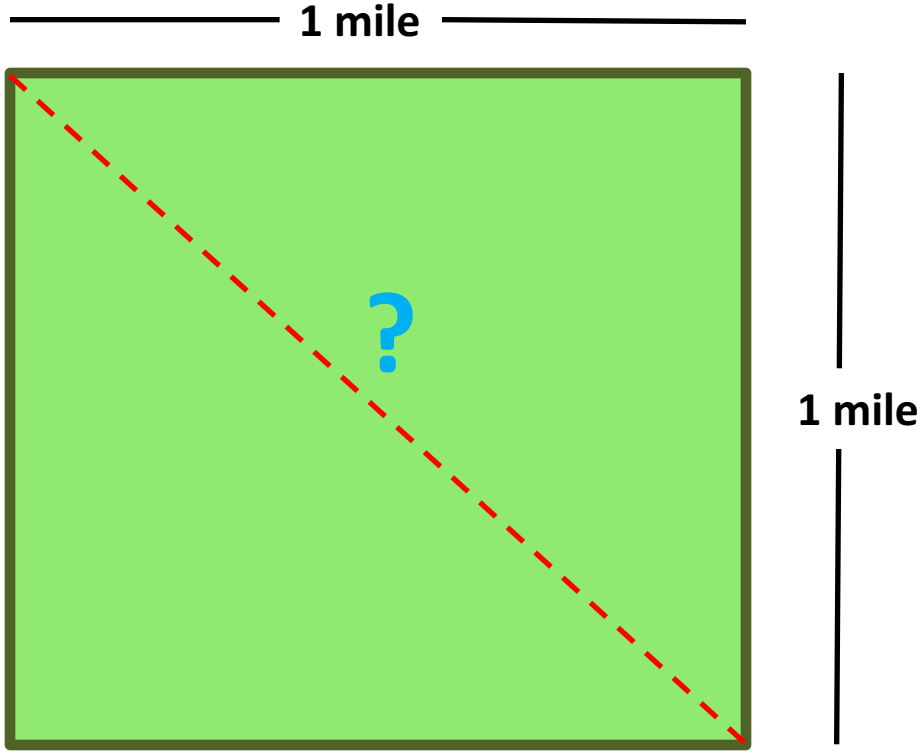
# QUESTION:

- **HOW FAR** does the catcher throw the ball when trying to catch a runner stealing 2nd?



# Back to this…

- If you walk from corner to corner of a field that is exactly 1 mile by 1 mile, how many miles did you walk?



# HOMEWORK

- Pythagorean Theorem Worksheet

- Use the back or attach a separate sheet if you need more room