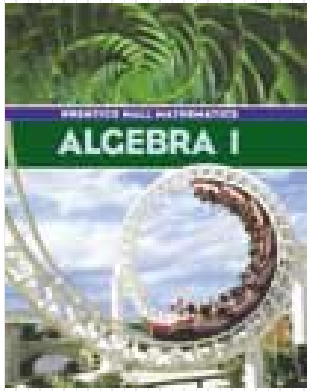
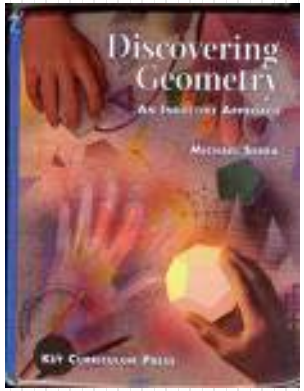
Mr. Northcutt's Math Classes
Class Presentation

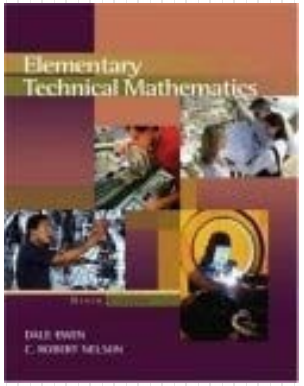
February 23, 2009 (106)



Math 1



Math 2



Applied Math

Math 1 – Daily Summary

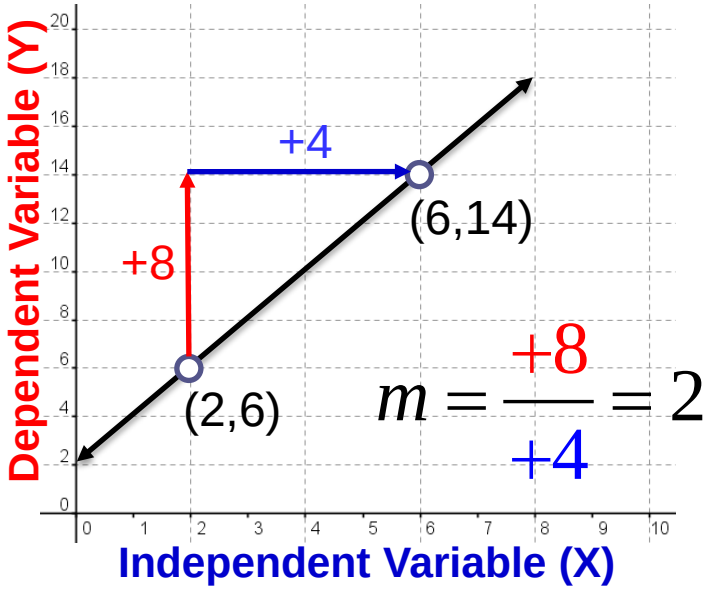
- **Announcements**
  - I have **Bus Duty** this week - will return to room at ~3:45
  - **QUIZ**: Sections 6.1 thru 6.4 on Friday
- **Class Objectives – *What you should learn today*!**
  - QUIZ Review
  - More work with Slope-Intercept Form of a Line
    - Finding Slope and y-intercept…from an equation, or a graph
    - Writing an Equation…given slope and y-intercept, or a graph
    - Graphing a Linear Equation
    - Word Problems using Linear Equations
- **Assignment**
  - **Section 6-2:** 2-56 EVEN, 59-64, 69-74

Hand In HW Tuesday in Class. *NO LATE HW!*

Slope (or Rate of Change)

- **Slope (or Rate of Change) is a <u>Ratio</u> that compares the change in <u>Two Variables</u>:**

$$\text{Rate of Change (Slope)} = \frac{\text{Change Dependent Variable}}{\text{Change Independent Variable}}$$

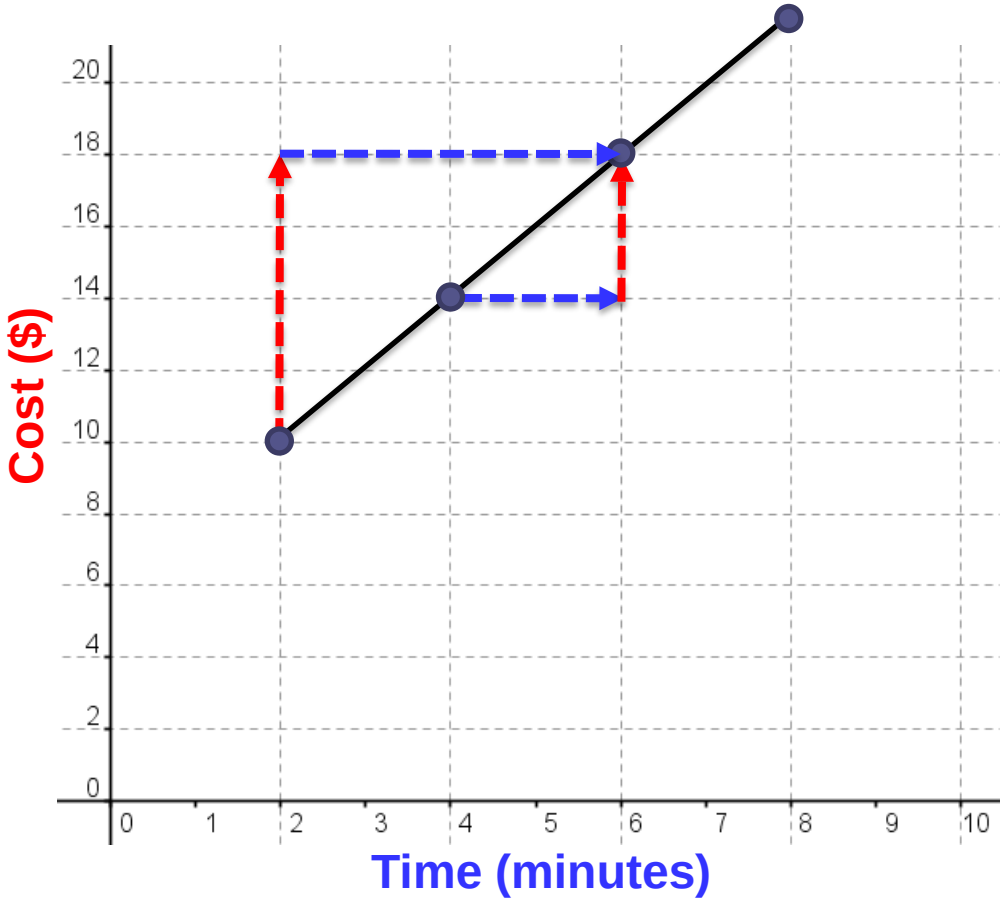


$$m = \frac{rise}{run} = \frac{\Delta y}{\Delta x} = \frac{y_2 - y_1}{x_2 - x_1}$$

Rate of Change (from Data)

- **Find the Rate of Change (or Slope) of the data.**

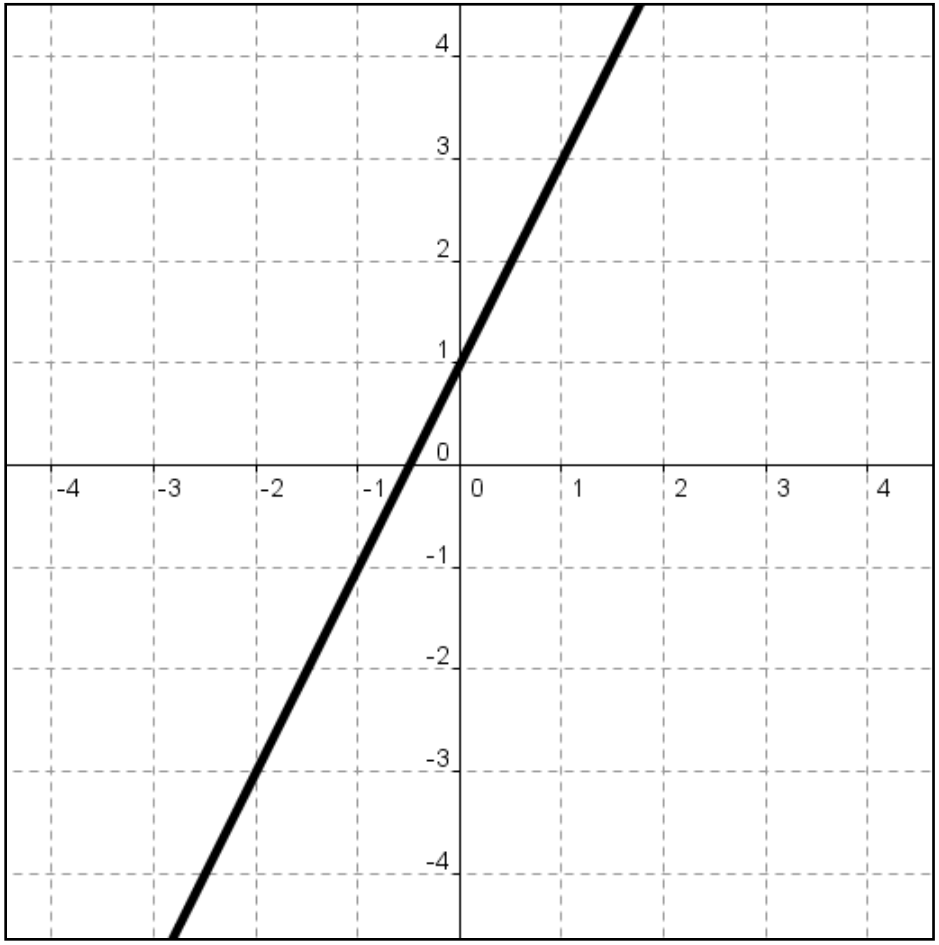
Time (min)	Cost ($)
2 min.	$10
4 min.	$14
6 min.	$18
8 min.	$22

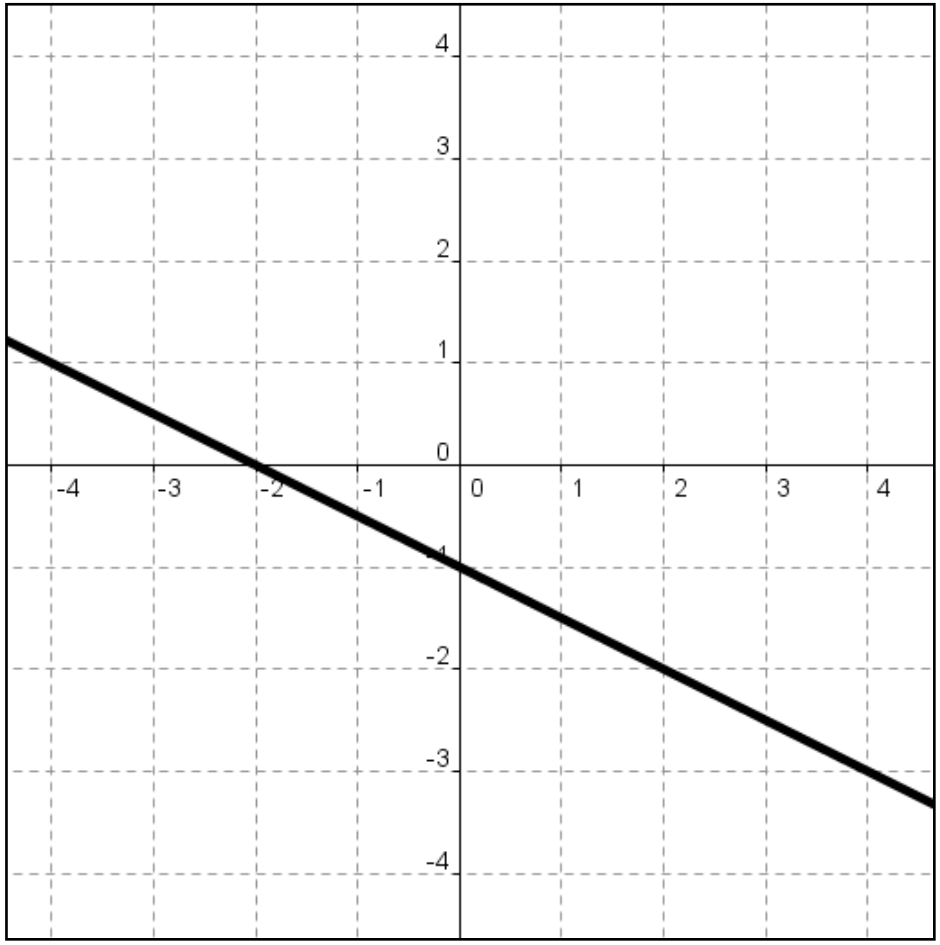


$$Slope = \frac{\$}{\text{min}}$$

Specify UNITS with Slope.

Find Slope from the Graph



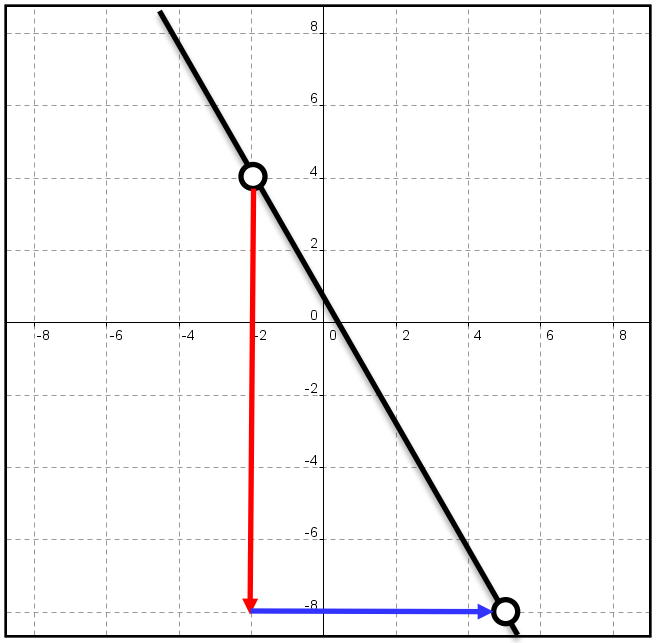


Find Slope Given Points

$$m = \frac{rise}{run} = \frac{\Delta y}{\Delta x} = \frac{y_2 - y_1}{x_2 - x_1}$$

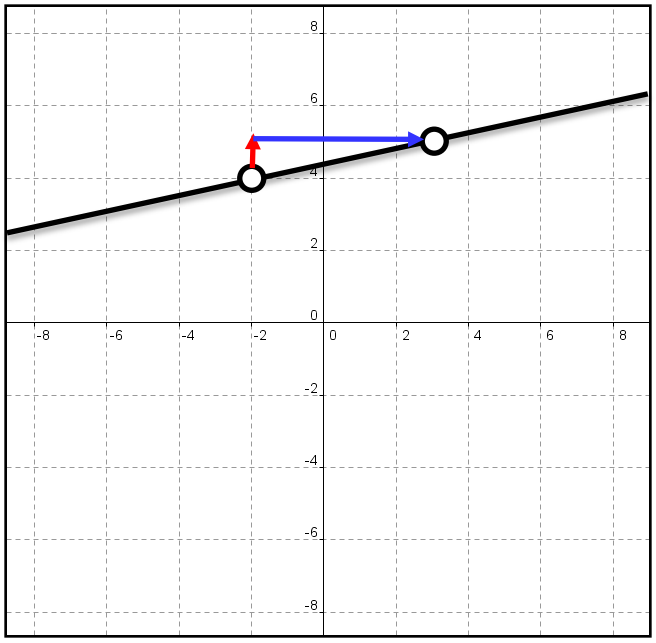
- (-2,4) & (5,-8)

$$m = \frac{-8-4}{5-(-2)} = \frac{-12}{7} = -\frac{12}{7}$$



- (-2,4) & (3,5)

$$m = \frac{5-4}{3-(-2)} = \frac{1}{5}$$



Slope-Intercept Form of a Line

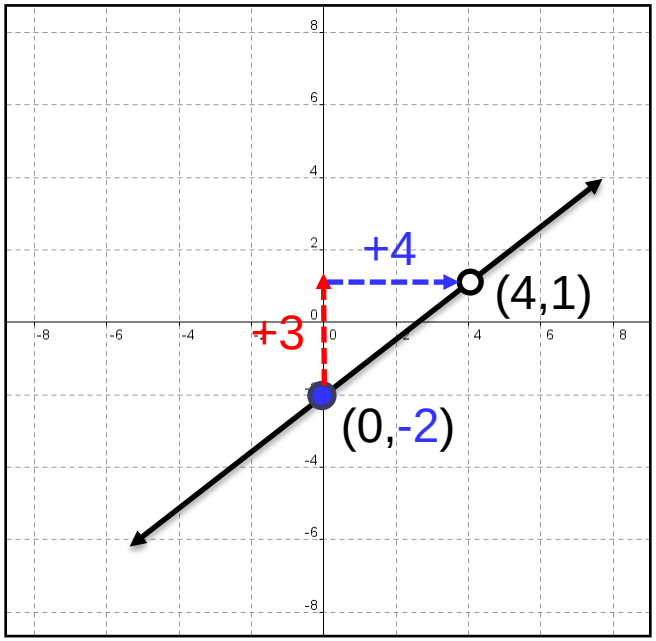
- **Slope-Intercept Form (Equation) of a Line**

$$y = \frac{3}{4}x - 2$$

$$y = mx + b$$

Slope

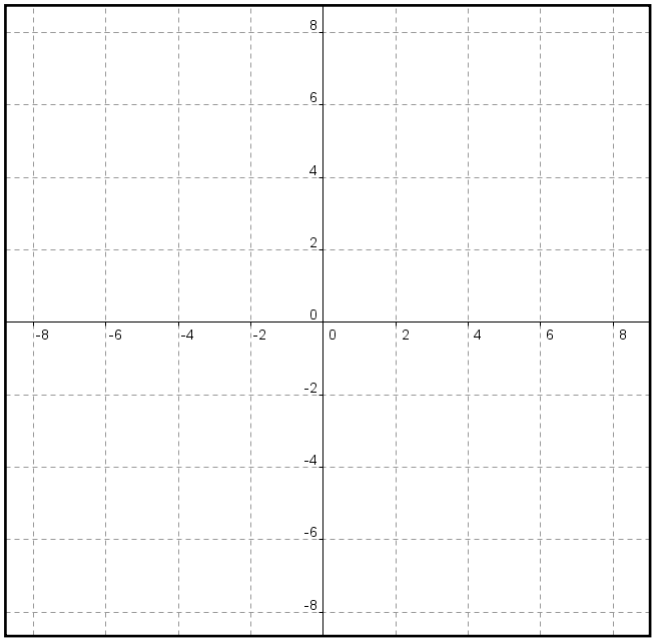
y-intercept



Slope & y-intercept from Equation

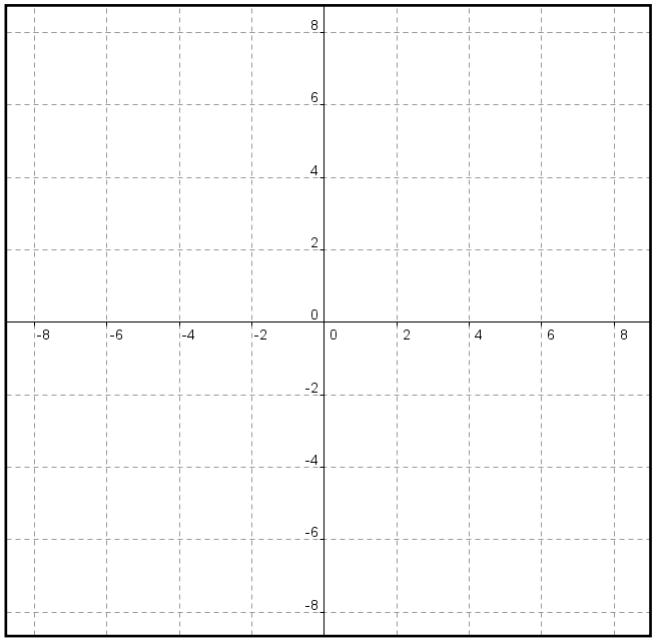
$$y = \frac{1}{2}x - 1$$

$m =$ _____ ; $b =$ _____



$$y + x = -1$$

$m =$ _____ ; $b =$ _____



$$y = mx + b$$

Math 2 – Daily Summary

- **Announcements**
  - **Great Job on Quiz last week - You get a Reward!**
  - I have **Bus Duty** this week - will return to room at ~3:45
  - **QUIZ**: Lessons 10.1 thru 10.6 on Friday
- **Class Objectives – *What you should learn today*!**
  - QUIZ Review (very little!)
  - Ability to Multiply & Simplify Square Roots
  - Understand and Apply Properties of (45º-45º) Right Triangle
- **Assignment**
  - **Lesson 10.4**: 1-21, 28

Square Root Definition & Properties

- **DEFINITION: Square Root (*r*) of a Number (*x*)**
  - A number r whose square is x.

$$r = \sqrt{x} \qquad r^2 = (\sqrt{x})^2 = x$$

- **Multiplication Property of Square Roots**

$$\sqrt{xy} = \sqrt{x}\sqrt{y} \qquad \sqrt{72} = \sqrt{36}\sqrt{2} = 6\sqrt{2}$$

- **Exponential Form of Square Roots**

$$\sqrt{x} = x^{1/2} \qquad \sqrt{36} = 36^{1/2} = 6$$

Example: Simplifying Square Roots

- **Simplify.** $\sqrt{722}$

1. Prime Factors

$$722$$
$$2 \cdot 361$$
$$2 \cdot 19 \cdot 19$$

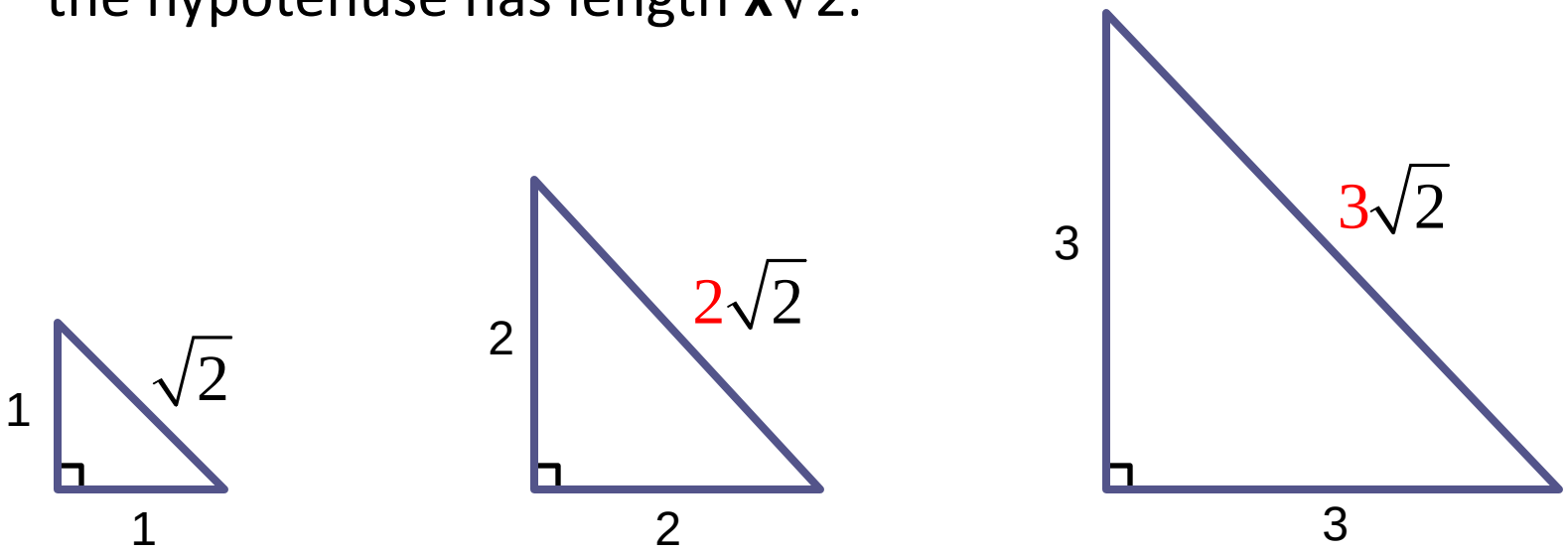
2. Simplify Perfect Squares

$$\sqrt{2 \cdot 19 \cdot 19}$$
$$\sqrt{2} \cdot \sqrt{19^2}$$
$$19\sqrt{2}$$

$$\sqrt{722} = 19\sqrt{2}$$

Isosceles Right Triangle Conjecture

- **Isosceles Right Triangle Conjecture**
  - Given an isosceles right triangle with legs of length **x**, then the hypotenuse has length **x**$\sqrt{2}$.



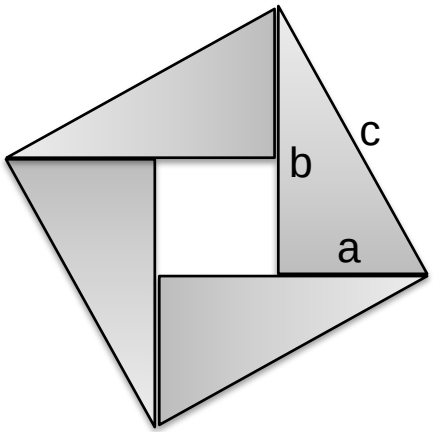
How could you prove this?

Applied Math – Daily Summary

- **Announcements**
  - I have **Bus Duty** this week - will return to room at ~3:45
  - **QUIZ**: Sections 13.1 thru 13.3 on Friday
- **Class Objectives – *What you should learn today*!**
  - Review of Trigonometric Ratios (for Right Triangles)
    - Understand and apply the Pythagorean Theorem
    - Understand and apply Trigonometric Ratios to Right Triangles
- **Assignment**
  - Finish Math Caching Project - **Due TODAY!**
    - ***Send the Word file to me as an e-mail attachment***
  - **Exercises 13.1**: 1-10, 12-24 by 3, 25-30, 33-48 by 3

Investigation

1. **FOLD a sheet of paper in ½ twice (two folds).**
2. **CUT the folded sheet straight across to create 4 congruent RIGHT triangles then cut to separate the 4 triangles.**
3. **LABEL the sides of each triangle (a, b and c - letting c be the longest side). Label each the same!**
4. **ARRANGE the triangle as shown below…**

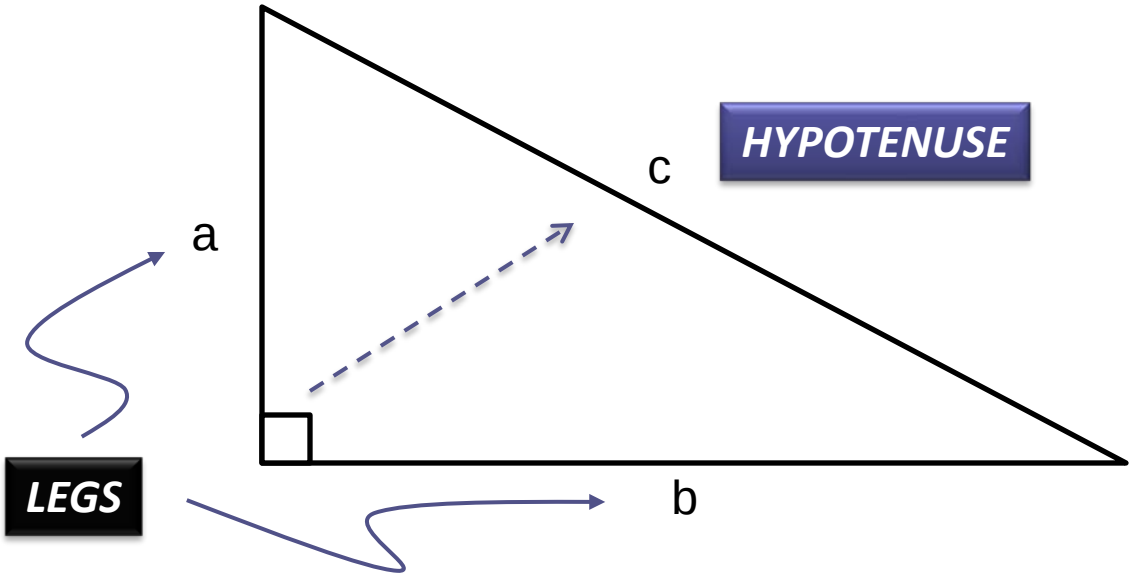


$$Area_{\text{Large Square}} = Area_{\text{Small Square}} + Area_{\text{Triangles}}$$

Pythagorean Theorem

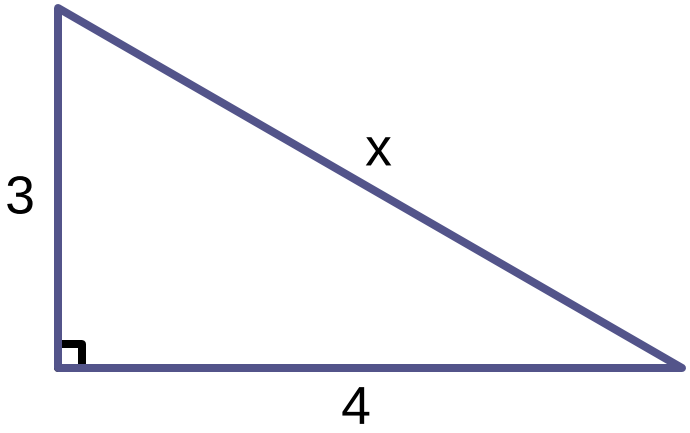
- **For <u>ANY RIGHT TRAINGLE:</u>**
  - If a and b are the lengths of the legs and c is the length of the hypotenuse, then:

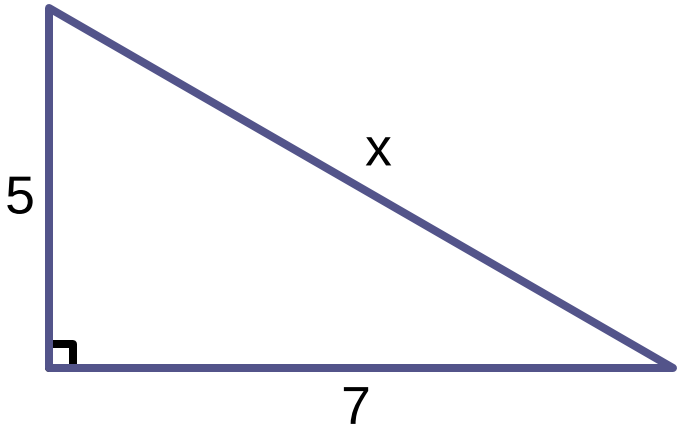
$$a^2 + b^2 = c^2$$



Examples:

- **Find missing side length…**





Trigonometric Ratios (Right Triangles)

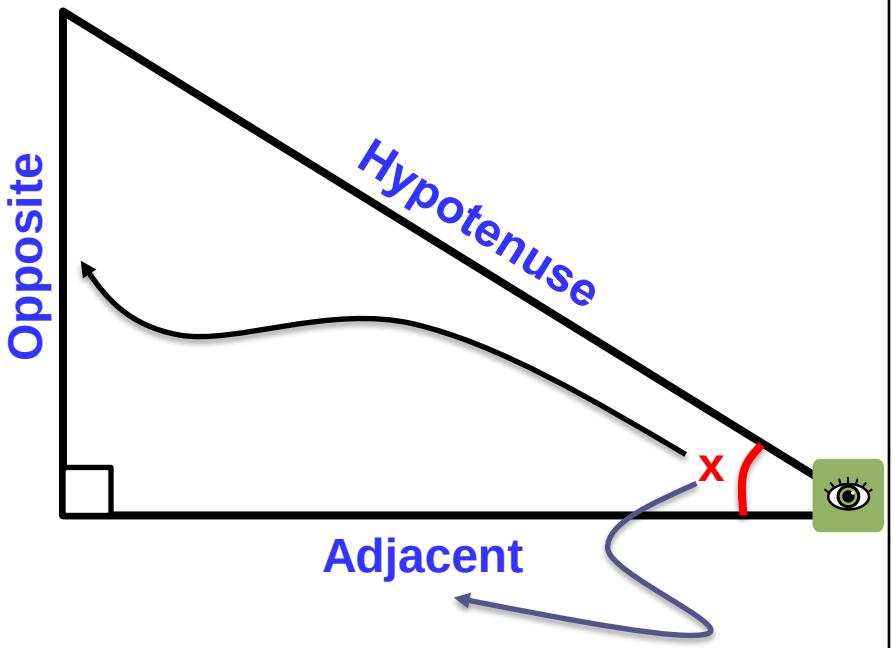
- **Sine, Cosine & Tangent of an angle.**

$$\sin\angle x = \frac{Opposite}{Hypotenuse}$$

$$\cos\angle x = \frac{Adjacent}{Hypotenuse}$$

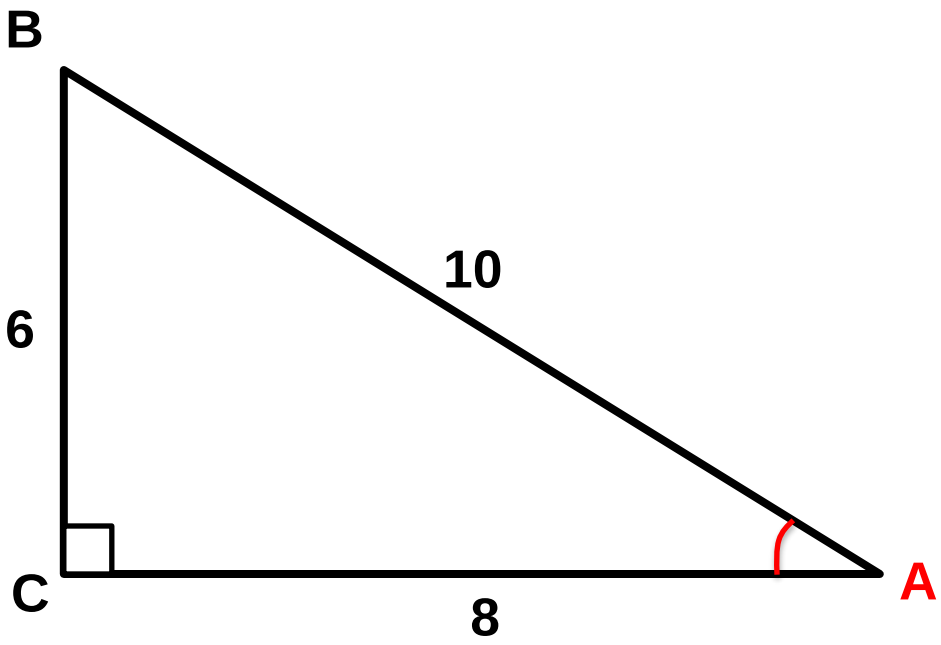
$$\tan\angle x = \frac{Opposite}{Adjacent}$$

S
O
H
-
C
A
H
-
T
O
A



Examples

- **Find sin ∠A, cos ∠A, tan ∠A**



$\sin A =$ _____

$\cos A =$ _____

$\tan A =$ _____

S O H - C A H - T O A

Using Calculator for Trig. Functions

- **Verify in DEGREES mode!**

- **Find the following:**

$$\sin 60° = \_\_\_\_\_$$

$$\cos 45° = \_\_\_\_\_$$

$$\tan 30° = \_\_\_\_\_$$