Public Access

Name_____ **Pd.**___

Slopes for the mathematically inclined.

The engineering firm you work for has been hired to check public buildings for correct stairs and wheelchair access. You have been assigned to evaluate existing wheelchair ramps and look at steps that need to be converted to ramps. It's a good thing that you remember from your high school Algebra 1 class that slope is calculated by measuring the height (rise) and the length (run) of any part of the ramp or step!

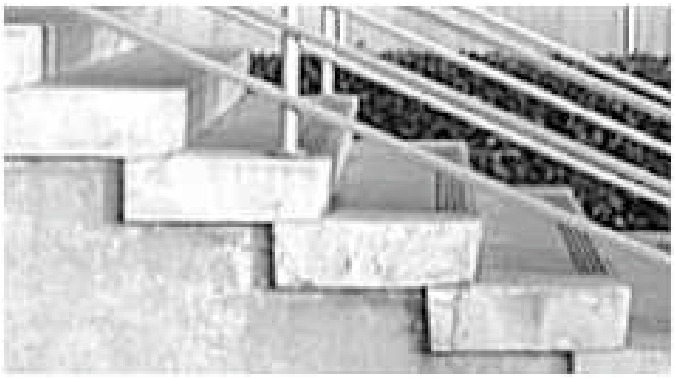
Evaluating stairs

Using building codes for steps, the ideal ratio of riser to tread is 0.7 where the riser is the rise of the step and the tread is the run of the step.

$$\frac{rise}{run} \bullet 100 = \% \text{ slope}$$

What percent slope would legal steps be equal?_____

1. Using the pictures below, measure the riser and tread of three consecutive steps. Use your ruler to measure the riser and tread in millimeters and then compute the slope of each step.



	Riser (mm)	Tread (mm)	% Slope	Legal ?
Step #1				
Step #2				
Step #3				
Step average				

	Riser (mm)	Tread (mm)	% Slope	Legal?
Step #1				
Step #2				
Step #3				
Step average				

Real World Application

2. Find a flight of stairs on campus and measure the height and depth of 3 different steps. Find the slope and determine if the steps would be legal.

	rise	**run**	**% slope**	**Legal?**
Step #1				
Step #2				
Step #3				
Step Average				

Evaluating ramps

The law in Virginia says wheelchair ramps cannot have a slope greater than "1 in 12". This means that for every 12 inches of run, there can't be more than 1 inch of rise.

$$\frac{rise}{run} \bullet 100 = \% \text{ slope}$$

What percent slope would a legal ramp be equal?_____

3. Using the pictures below put two points on the ramp and make a right triangle by constructing the rise and run. Use your ruler to measure the rise and run and compute the slope of each ramp. Pick two different points on the ramp and repeat.

	Rise (mm)	Run (mm)	% Slope	Legal?
First try				
Second try				
Ramp average				

	Rise (mm)	Run (mm)	% Slope	Legal?
First try				
Second try				
Ramp average				

Real World Application

4. Find a ramp on campus and measure the rise and run twice for accuracy. Find the slope and determine if the ramp would be legal.

Ramp	rise	run	% slope	Legal?
First try				
Second try				
Ramp Average				

5. What difficulties did you encounter when doing this activity?

6. Where could there be errors in your measurements?