Today is 11/6/17
Get out Note Packet, ruler and a calculator

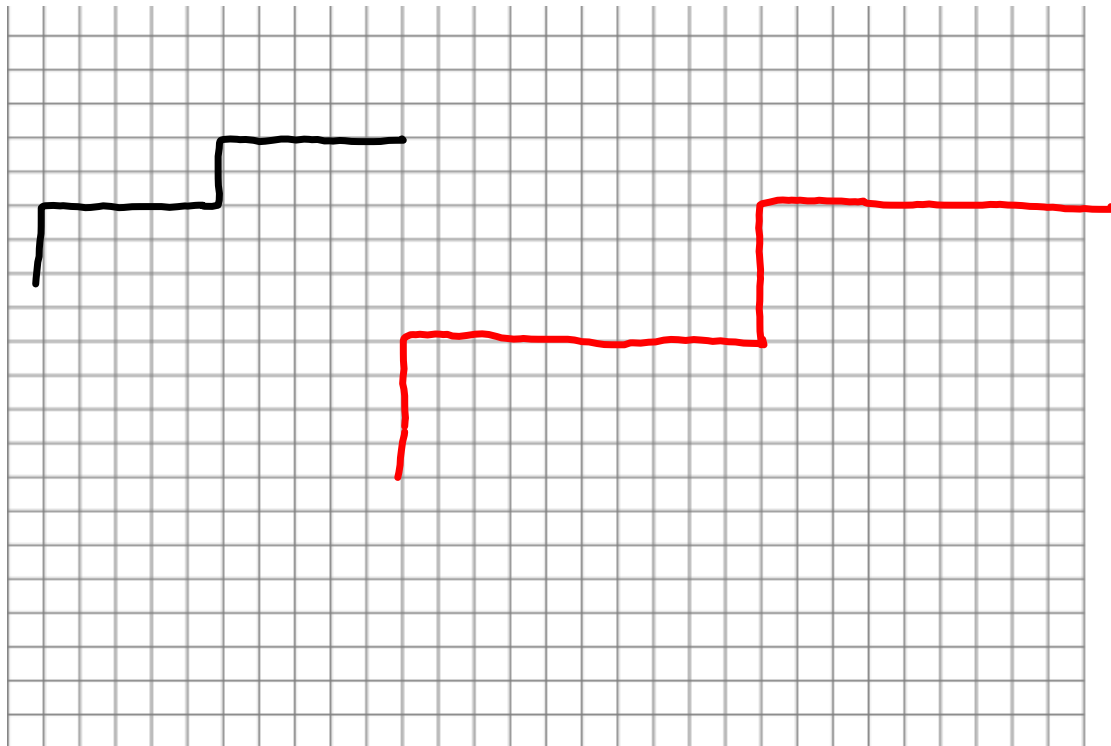| Agenda:	Test Tuesday
Brain teaser	11/14 and
Staircase Lab	Wednesday
	11/15

1. A carpenter is building a staircase. The slope of the staircase must be $2/5$. On graph paper, draw three examples of a staircase that has a slope of $2/5$.

2. Each step of the staircase is to have a 12" tread. Accurately draw this on the graph paper (scale: 1 unit = 1 inch). What is the vertical rise of each step of a 12" tread, for a slope of ²/₅?

$$\frac{2}{5} = \frac{x}{12}$$

$$\frac{5x = 24}{5}$$

$$\boxed{4.8"}$$

3. Choose a method to quickly find the rise of a 12-inch tread for any slope ratio. Explain how the method works.

$$\frac{rise}{tread} = \frac{x}{12}$$

4. Use your method to find the rise that goes with a 12-inch tread, and a 10-inch tread for each slope ratio in the chart on the right.

$\frac{2}{8} = \frac{x}{12}$

Slope Ratio	Rise of a 12-inch tread	Rise of a 10-inch tread
2/5	4.8	4
5/8	7.5	6.25
3/4	9	7.5
5/6	10	8.3̄
2/2	12	10
6/5	14.4	12
4/3	16	13.3̄
8/5	19.2	16
5/2	30	25

$\frac{2}{5} = \frac{x}{10}$
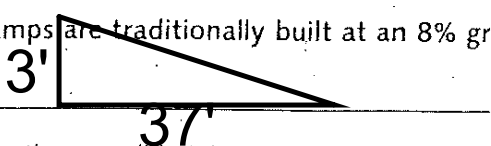
$\frac{5}{8} = \frac{x}{10}$

6. Why do you think slope is defined as "rise over run," instead of "run over rise?"

run/rise would show a smaller value representing a steeper slope

7. Find two staircases on your campus. Measure the attributes listed below and answer the questions.

12 stairs

	Staircase #1	Staircase #2
Tread:	10"	15"
Rise:	7"	4"
Slope of a Step:	7/10	4/15
Height:	84	49
Length:	120	180
Entire Slope:	84/120	49/180
Grade:	70 %	27 %

a) What are the measurements of the tread and the rise of each step of the staircase?

b) What is the slope of one step?

c) What are the overall height and length of the staircase?

d) What is the slope of the entire staircase? How does this compare to your answer in part (b)?

e) What is the percent grade of your staircase?

Wheelchair ramps are traditionally built at an 8% grade. Investigate the grade of a ramp at your school.

1. Ramp: 3' 37'

   a) What are the overall height and length of the ramp?   Height: _3'_   Length: _37'_
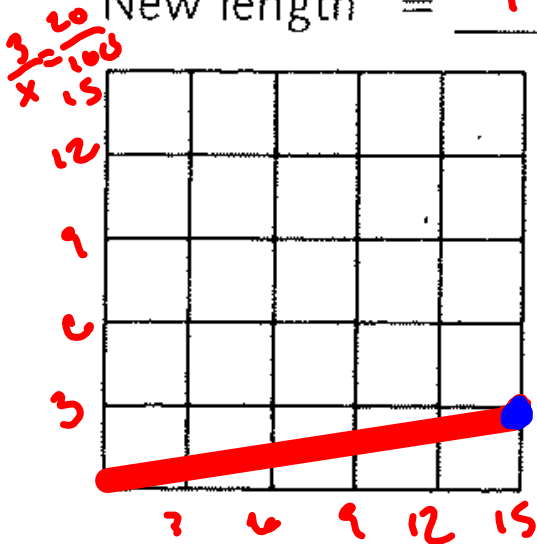
   b) What is the slope of the ramp? _3/37_   c) What is the percent grade of the ramp? _8%_

   3 ÷ 37 = .081

2. For each percent grade below, find its corresponding slope and create a scale drawing to represent a ramp with that particular slope. Assume the ramp has the same height as the ramp that you measured the other day, and determine the new length for the given percent grade. Height of ramp: **3'**
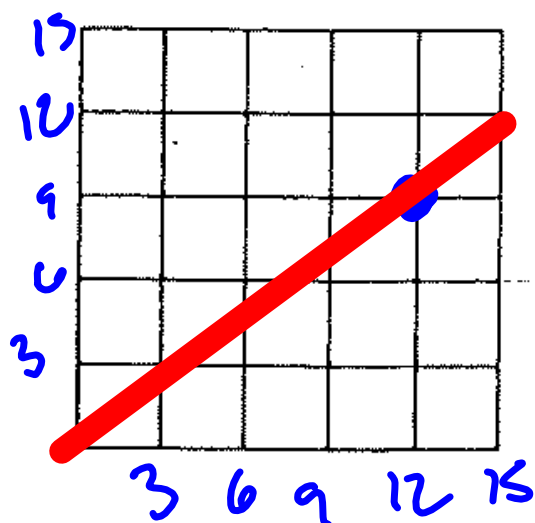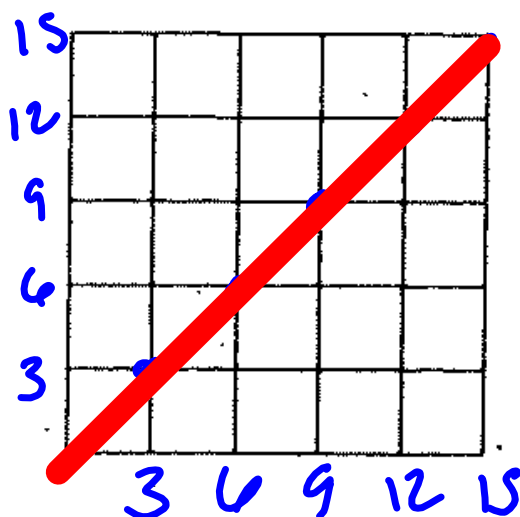
a) 20%, slope = **3/15**

New length = **15**

$\frac{3}{x} = \frac{20}{100}$
$x \cdot 15$

b) 50%, slope = **3/6**

New length = **6**

$\frac{3}{x} = \frac{50}{100}$
$x \cdot 15$
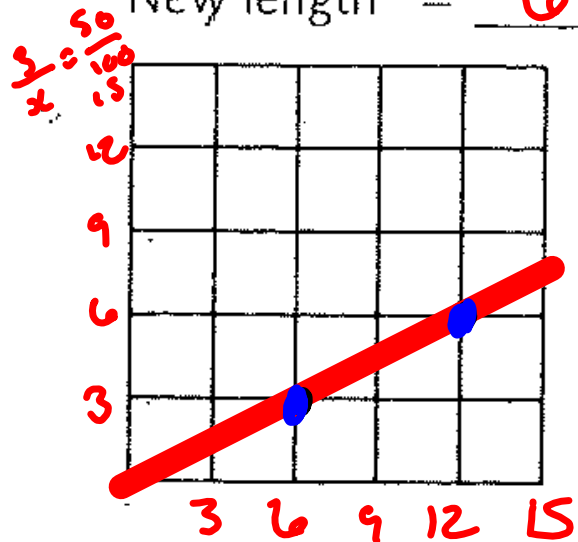
c) 75%, slope $= \dfrac{\frac{3}{4} : \frac{9}{12}}{4}$

New length $= \underline{\quad 4 \quad}$

d) 100%, slope $= \underline{\quad 3/3 \quad}$

New length $= \underline{\quad 3 \quad}$

e) 150%, slope = $\dfrac{3/2 = \frac{9}{6}}{}$ 　f) 200%, slope = $\dfrac{3/1.5 = \frac{6}{3}}{}$
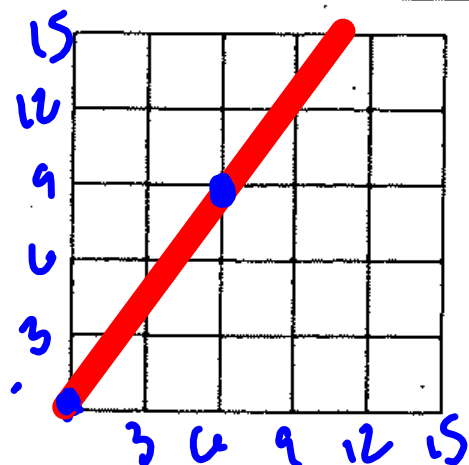
New length = $\underline{2}$ 　　　New length = $\underline{1.5}$
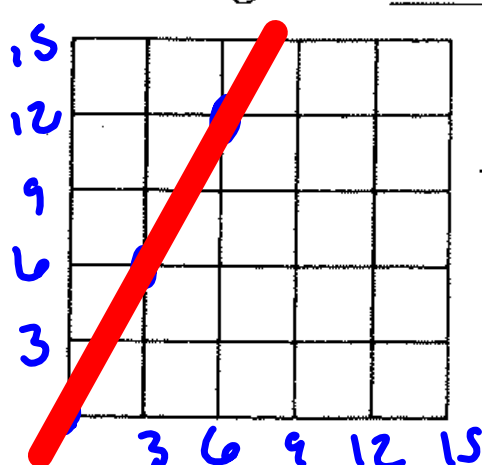
3. Choose the height of one of the staircases that you measured. Staircase # __1__   Height: __84"__
   What would be the horizontal length of a wheelchair ramp that has the same height as the staircase with a...

a) ...slope of $5/12$.

$$\frac{5}{12} = \frac{84}{x}$$

$$\frac{1008 = 5x}{5} \quad \frac{5x}{5}$$

$$201.6 = x$$

b) ...percent grade of 8%.

$$\frac{8}{100} = \frac{84}{x}$$

$$\frac{8x}{100} = \frac{8400}{100}$$

$$x = 1050$$