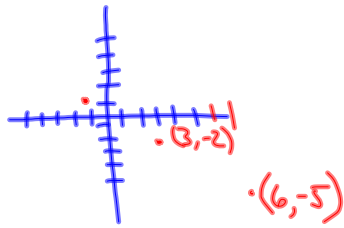
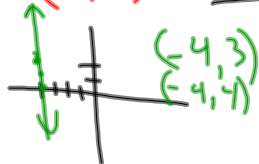


46. $(-1, 1) \quad m = \frac{-3}{4} = \frac{\text{rise}}{\text{run}}$



40. $(-4, 2) \quad m$ is undefined

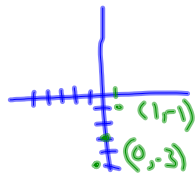


22. $(-1, \frac{4}{9}) \quad (\frac{2}{7}, \frac{3}{7})$
 $x_1 \quad y_1 \quad x_2 \quad y_2$

$$m = \frac{y_1 - y_2}{x_1 - x_2} = \frac{\frac{4}{9} - \frac{3}{7}}{-1 - \frac{2}{7}} = \frac{\frac{4}{9} - \frac{3}{7}}{-\frac{9}{7}} = \frac{-\frac{23}{63}}{-\frac{9}{7}} = \frac{-23}{9} \cdot \frac{7}{9} = \frac{-161}{81}$$

42. $(-1, -5) \quad m = \frac{2}{1} = \frac{\text{rise}}{\text{run}}$

rising



24.

$(3, 4, 0) \quad (3, 4, 1)$
 $x_1 \quad y_1 \quad x_2 \quad y_2$

$$m = \frac{y_1 - y_2}{x_1 - x_2}$$

$$= \frac{0 - 1}{3 - 3} = \frac{-1}{0}$$

undefined
vertical

20. $(-\frac{3}{2}, -\frac{1}{2}) \quad (\frac{5}{8}, \frac{1}{2})$
 $x_1 \quad y_1 \quad x_2 \quad y_2$

$$m = \frac{y_1 - y_2}{x_1 - x_2}$$

$$= \frac{-\frac{1}{2} - \frac{1}{2}}{-\frac{3}{2} - \frac{5}{8}} = \frac{-1}{-\frac{17}{8}} = -1 \cdot \frac{-8}{17} = \frac{8}{17}$$

rising

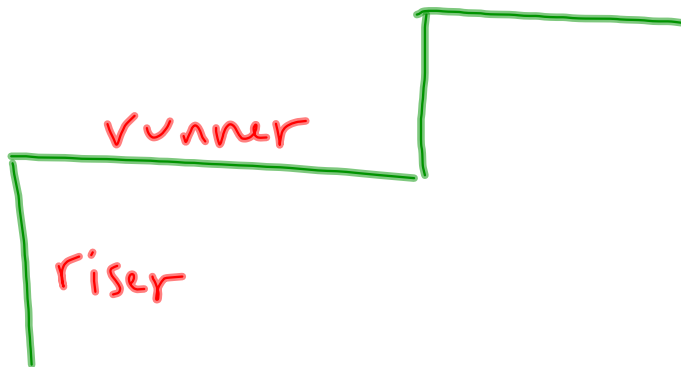
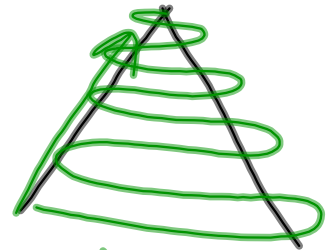
0 - 6 +
7 - 12 ✓
13 ↑ -

2.3 slope

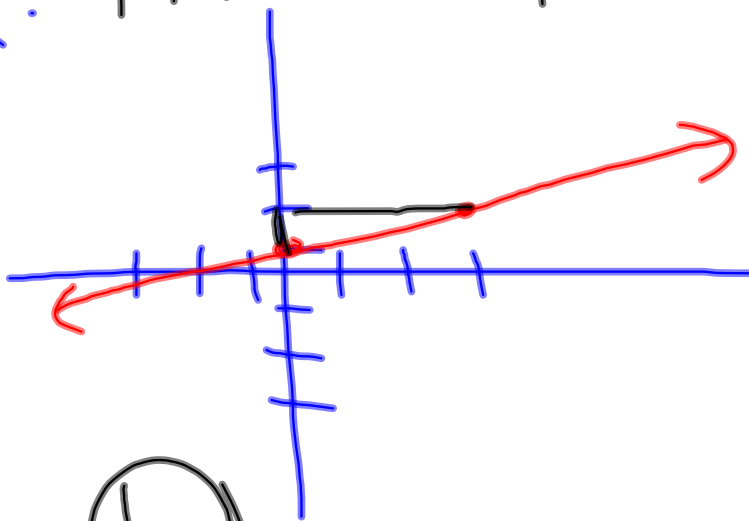
slope : steepness of a line

$$\underline{\text{slope}} = \frac{\text{rise}}{\text{run}} = \frac{\uparrow \downarrow}{\rightarrow}$$

Slope : $m = \frac{y_1 - y_2}{x_1 - x_2}$



Ex: Find the slope:



$$\frac{\text{rise}}{\text{run}} = \left(\frac{1}{3} \right)$$

Ex: Find the slope thru

$$\underbrace{(2, -1)}_{x_1 \quad y_1} \quad \& \quad \underbrace{(3, 1)}_{x_2 \quad y_2}$$

$$m = \frac{y_1 - y_2}{x_1 - x_2}$$

$$= \frac{-1 - 1}{2 - 3}$$

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

$$= \textcircled{2}$$

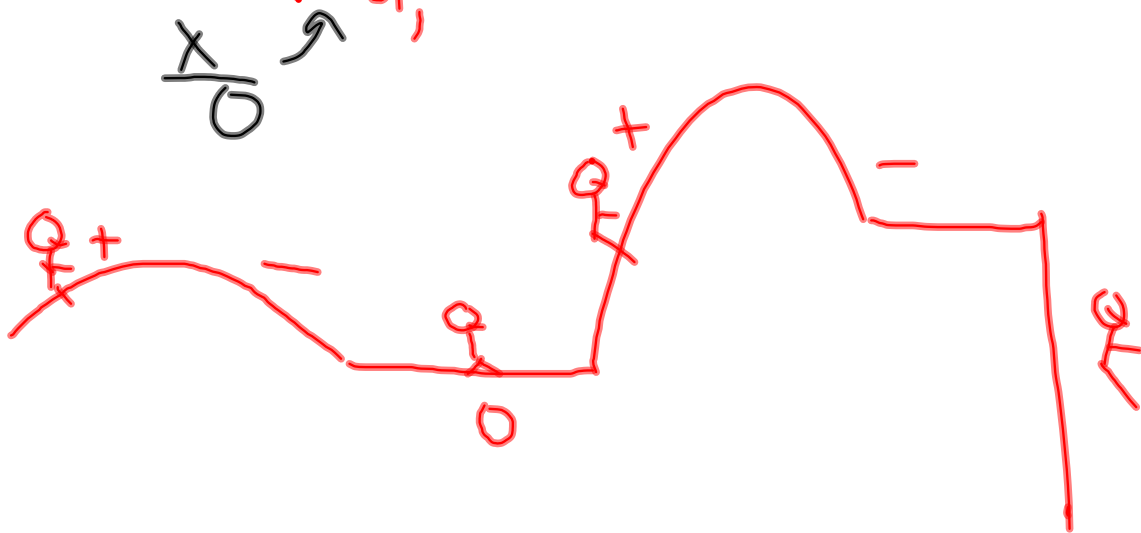
4 conditions

$m > 0$, rises from left to right

$m < 0$, falls from left to right

$m = 0$, horizontal line

m is undefined, vertical line

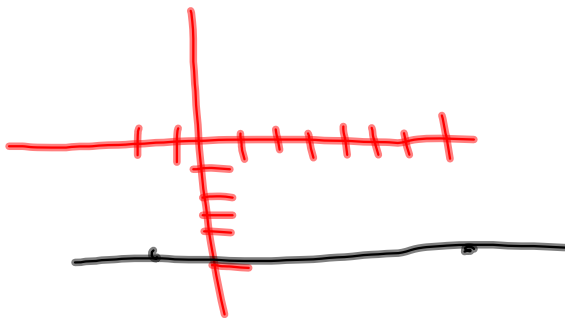


Ex: Find the slope
 $(2, -5)$ and $(7, -5)$
 x_1 y_1 x_2 y_2
rise, fall, vertical or horizontal.

$$m = \frac{y_1 - y_2}{x_1 - x_2}$$

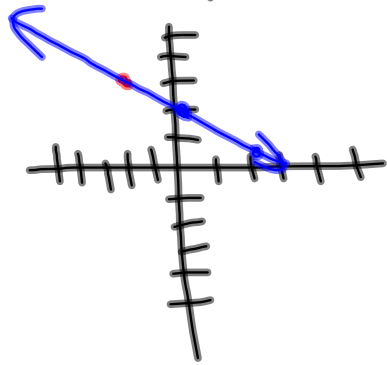
$$= \frac{-5 - (-5)}{2 - 7} = \frac{0}{-5} = 0$$

horizontal



Ex: sketch a line thru
 $(-2, 3)$ with a slope of $-\frac{1}{2}$.

1. graph the point
2. use the slope to find another point.



$$m = -\frac{1}{2} = \frac{\text{rise}}{\text{run}} = \frac{\text{down } 1}{\text{right } 2}$$

parallel & perpendicular lines

parallel : lines that never intersect.

- lines have the same slope

perpendicular : lines that meet at right angles

- lines have slopes that are opposite reciprocals

$$-\frac{1}{2} \Rightarrow 2$$

$$\frac{2}{3} \Rightarrow -\frac{3}{2}$$

Slope-intercept form

$$y = mx + b$$

↓ ↓
Slope y-int

Ex: Put $-2x + 4y = 8$ into S-I form

$$\begin{array}{r} +2x \\ \hline -2x + 4y = 8 \\ +2x \end{array}$$

$$\frac{4y}{4} = \frac{2x}{4} + \frac{8}{4}$$

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

$$b = -2, \quad m = \frac{1}{2}$$

$(0, 2)$

① get rid of x
by + or -

② divide or multiply
to get rid of
coefficient on y

Determine if the lines are parallel, perpendicular, or neither

$$5x + 20y = -30 \quad y = -\frac{1}{4}x + \frac{3}{2}$$
$$-12x + 3y = -10 \quad y = 4x - \frac{10}{3}$$

perpendicular

HW: p. 118

2-26, 32-46 all evens

