Video Lesson Suggestions

- take advantage of the "pause" feature
- too much text to read, hit pause
- example to work through, hit pause
- not understanding something, hit pause and rewind

"Rate of Change"

Learning Goal: Today's learning goal is to investigate the way a linear relationship changes by investigating its graph, its table of value, and its equation.

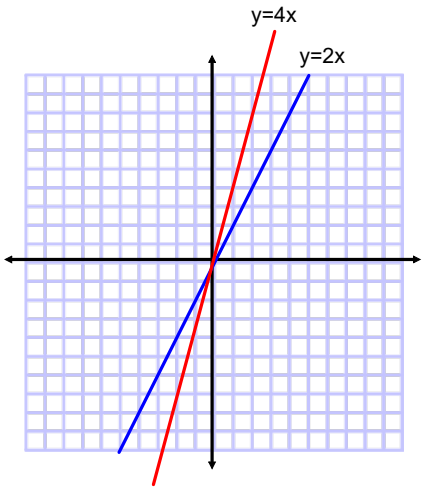
Graph the following two linear relations on the graph insert.
Comment on any differences you see between the two graphs.

y = 2x

x	y
-2	-4
-1	-2
0	0
1	2
2	4
3	6

y = 4x

x	y
-2	-8
-1	-4
0	0
1	4
2	8
3	12



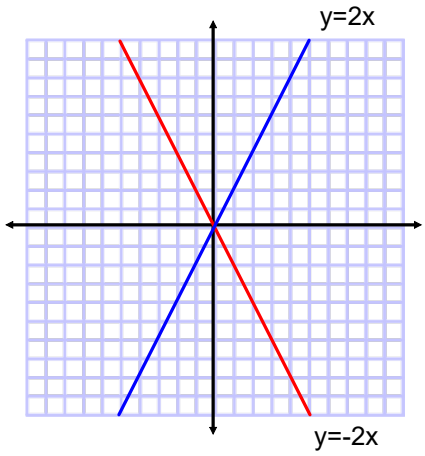
Graph the following two linear relations on the graph insert.
Comment on any differences you see between the two graphs.

y = 2x

x	y
-2	-4
-1	-2
0	0
1	2
2	4
3	6

y = -2x

x	y
-2	4
-1	2
0	0
1	-2
2	-4
3	-6



Observations:

$y = 2x$ vs $y = 4x$

$y = 2x$ vs $y = -2x$

The "steepness" of the line can also be referred to as the "slope" or as the "rate of change"(roc).

Positive slopes increase (go up) from left to right.

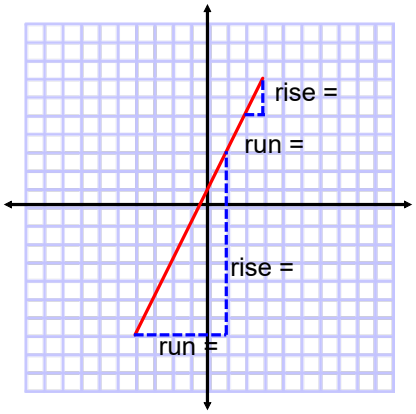
Negative slopes decrease (go down) from left to right.

The mathematical definition for the slope is as follows:

slope = $\frac{\text{rise}}{\text{run}}$

= $\frac{\text{change in y values}}{\text{change in x values}}$

= $\frac{\Delta y}{\Delta x}$

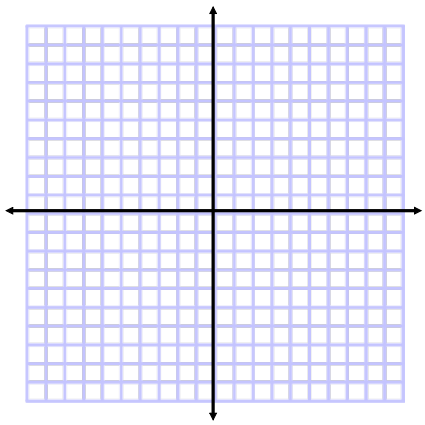


Be careful counting squars on the grid, that only works if each square is worth one unit.

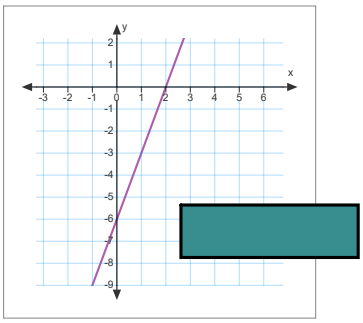
Determine the "slope" or "rate of change" for the following linear relationship.

$y = 3x - 2$

x	y	F.D.
-3		
-2		
-1		
0		
1		
2		
3		
4		



Determine the Slope and Y intercept for the following:



X	Y
-3	5
-2	3
-1	1
0	-1
1	-3
2	-5

Conclusions: the Slope for a linear relationship can be determined in several ways.

1. from the graph (rise over run)

2. from the table of values and first differences

3. from the equation (if its in the correct format)

(the multiplier on the x variable)

$y = 3x + 8$

Stan's summer job was mowing lawns. He recorded his pay and the number of hours spent mowing each lawn over the course of the summer.

What was Stan's ***hourly rate of pay***?

Hrs	$
3	27
1	9
4	36
2	18
6	54

Hrs	$

Consolidation Questions:

Grade 9 Academic
- page 156 #1, 2, 3, 5, 7(a,b), 8, challenge 13