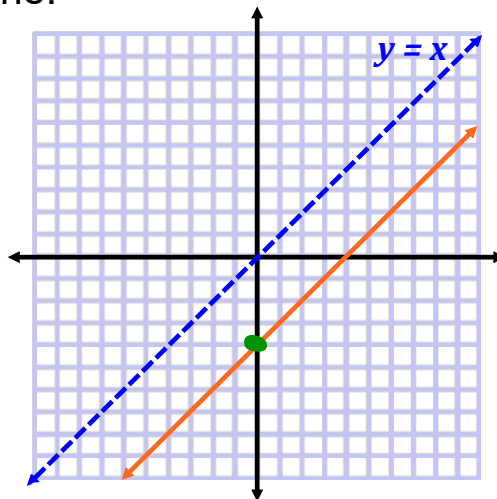


MTH1W Grade 9 Mathematics

4.6 Translations and Reflections of Lines

- Goal(s)**
- To explain what it means when a line has been translated and/or when it has been reflected.
 - To sketch the graph of a translated/reflected line and write the equation of the translated/reflected line.

Describe the translation that was applied to the dashed line to create the solid line.



Vertically
Translated
down 4

What would the equation of the solid line be?

$$y = x - 4$$

slope is unchanged

y-intercept is $(0, -4)$

The graph of the line $y = 3x$ undergoes a vertical translation **9 units up**.

What is the **slope** of the translated line?

$$= 3 \text{ (doesn't change)}$$

What is the **y-intercept** of the translated line?

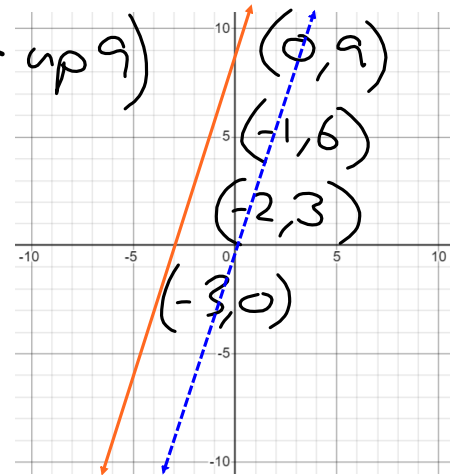
$$= (0, 9) \text{ (graph translates up 9)}$$

What is the **equation** of the translated line?

$$y = 3x + 9$$

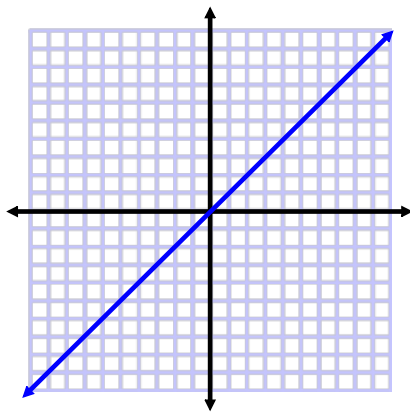
Sketch a graph of the translated line.

Begin with "b"
move with "m"

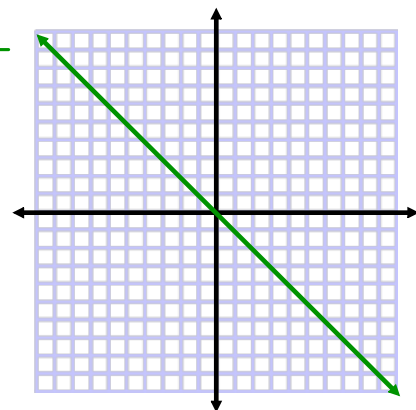


Consider the two graphs below and tables of values below. What is the same, what is different? How was the one on the right created from the one on the left?

x	y
-3	-3
-2	-2
-1	-1
0	0
1	1
2	2
3	3



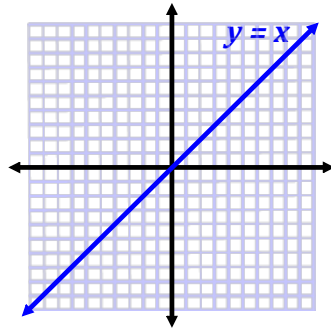
x	y
-3	3
-2	2
-1	1
0	0
1	-1
2	-2
3	-3



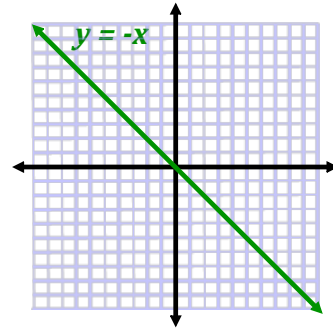
Blue line is Reflected in the x -axis
to create the green line.

A **reflection** of a linear relation changes the **slope** of the line from **positive to negative** or **from negative to positive**.

x	y
-3	-3
-2	-2
-1	-1
0	0
1	1
2	2
3	3

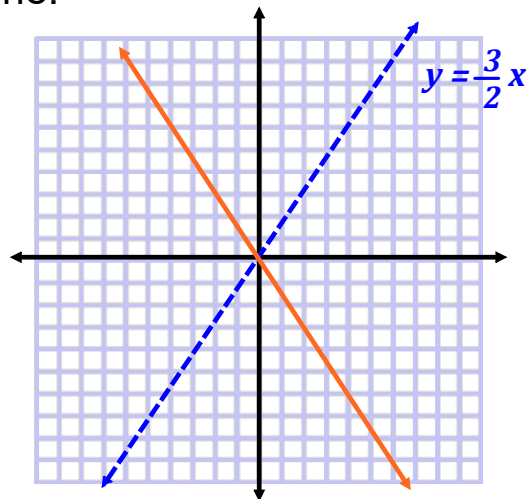


x	y
-3	3
-2	2
-1	1
0	0
1	-1
2	-2
3	-3



The graph of $y = x$ has been **reflected in the x-axis** to create the graph of $y = -x$.

Describe the transformation that was applied to the dashed line to create the solid line.



What would the equation of the solid line be?

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

only the sign changes, not the size of the slope.

The graph of the line $y = -3x$ undergoes a reflection in the x-axis.

What is the **slope** of the transformed line?

$$= 3 \text{ (only the sign changes)}$$

What is the **y-intercept** of the transformed line?

$$= (0, 0)$$

What is the **equation** of the transformed line?

$$y = 3x + 0 \Rightarrow y = 3x$$

Sketch a graph of the transformed line.

Begin with "b"
move with "m"

