

#### 4.7: Transformations of Linear Functions

“I WILL

...identify all transformations of functions.”

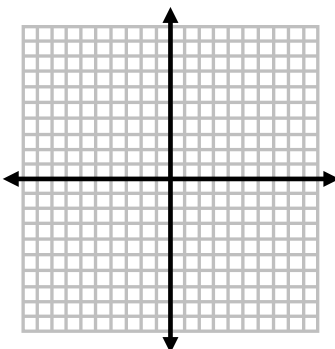
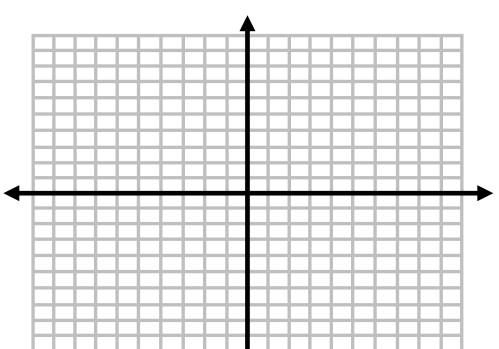
##### I. Transformations

- A. The parent function equation of a linear function is \_\_\_\_\_.
- B. The equation of a line using Slope-Intercept form is \_\_\_\_\_ where \_\_\_\_\_ is the slope and \_\_\_\_\_ is the y-intercept
- C. The change is \_\_\_\_\_ or \_\_\_\_\_ does change in size. The larger the \_\_\_\_\_, the \_\_\_\_\_ it gets. The smaller the \_\_\_\_\_, the \_\_\_\_\_ it gets. It does not matter whether the \_\_\_\_\_ is positive or negative.
- D. The change of the \_\_\_\_\_ or \_\_\_\_\_ does not change in size. It changes in location.

##### II. Function Notation

- A. Known as “short-hand” writing
- B.  $f(x)$  does NOT mean  $f$  times  $x$ , it is known as “ $f$  is a function of  $x$ ”
- C. When  $x$  is given, plug the equation in and solve
- D. Simplify

##### III. Model Problems

<p>Ex 1: Graph <math>y = x + 3</math> and compare to <math>y = x</math></p> <table border="1" style="display: inline-table; border-collapse: collapse;"><thead><tr><th style="padding: 5px;"><math>x</math></th><th style="padding: 5px;"><math>y</math></th></tr></thead><tbody><tr><td style="height: 20px;"></td><td></td></tr><tr><td style="height: 20px;"></td><td></td></tr><tr><td style="height: 20px;"></td><td></td></tr><tr><td style="height: 20px;"></td><td></td></tr><tr><td style="height: 20px;"></td><td></td></tr></tbody></table> 	$x$	$y$											<p>Ex 2: Graph <math>y = x - 4</math> and compare to <math>y = x</math></p> 
$x$	$y$												

<p>Ex 3: Graph <math>y = 2x</math> and compare to <math>y = x</math></p> <table border="1" style="display: inline-table; border-collapse: collapse; margin-right: 20px;"> <thead> <tr> <th style="padding: 5px;"><math>x</math></th> <th style="padding: 5px;"><math>y</math></th> </tr> </thead> <tbody> <tr><td style="height: 20px;"> </td><td> </td></tr> <tr><td style="height: 20px;"> </td><td> </td></tr> <tr><td style="height: 20px;"> </td><td> </td></tr> <tr><td style="height: 20px;"> </td><td> </td></tr> <tr><td style="height: 20px;"> </td><td> </td></tr> </tbody> </table>	$x$	$y$											<p>Ex 4: Graph <math>y = 1/2x</math> and compare to <math>y = x</math></p>
$x$	$y$												
<p>Ex 5: Draw the function from the parent function <math>y = x</math> and the y-intercept moves up 4 spaces</p>	<p>Your Turn: Draw the function from the parent function <math>y = x</math> and the y-intercept moves down 5 spaces</p>	<p>Ex 6: Draw the function from the parent function <math>y = x</math> and the slope is 2 times the original function</p>											
<p>Ex 7: Draw the function from the parent function <math>y = x</math> and the slope is <math>1/2</math> times the original function</p>	<p>Ex 8: Draw the function from the parent function <math>y = x</math> and the slope is <math>1/3</math> times the original function, reflected</p>	<p>Your Turn: Draw the function from the parent function <math>y = x</math> and the slope is 4 times the original function</p>											
<p>Ex 9: Given <math>f(x) = x - 3</math>, determine <math>f(2)</math>.</p>	<p>Ex 10: Given <math>f(x) = 2x - 10</math>, determine <math>f(6)</math>.</p>	<p>Your Turn: Given <math>f(x) = -4x + 12</math>, determine <math>f(-8)</math>.</p>											