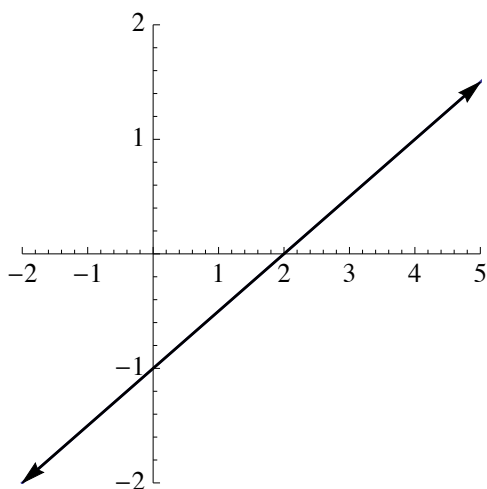


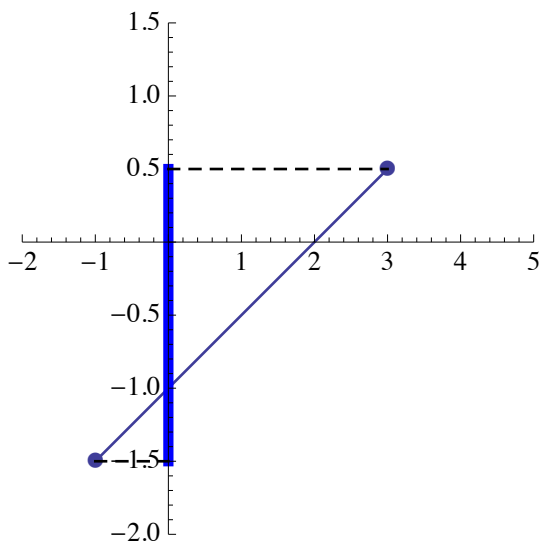
## Range of a Function (review)

The **Range** of a function is analogous to the domain, except rather than considering the allowable input values ( $x$  values) we consider the allowable output values ( $y$  values). Below is the plot of a line  $y = \frac{1}{2}x - 1$ :



As noted in previous notes, the domain of a line is the set of real numbers. The range of a (non-horizontal) line is also the set of real numbers: for any  $y$  value that is an element of the real numbers, we can always find an  $x$  value that will give us this  $y$  value. The range of a (non-horizontal) line is thus  $(-\infty, \infty)$ .

For a line segment, such as the one shown below, we can only choose  $x$  values between  $-1$  and  $3$  to get a corresponding  $y$  value. The range of the  $y$  values is thus limited to  $[-1.5, 0.5]$ ; or, alternatively  $-1.5 \leq y \leq 0.5$ .



For a line segment with endpoints  $(x_0, y_0)$  and  $(x_1, y_1)$  its range is  $\{y_0, y_1\}$ .