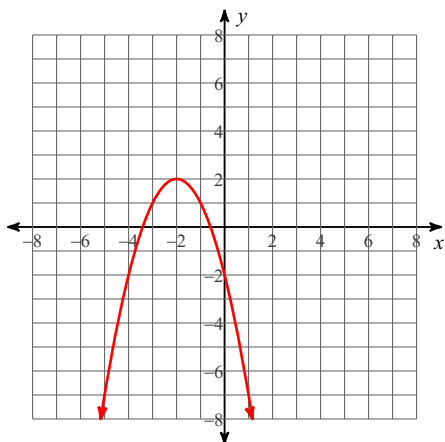


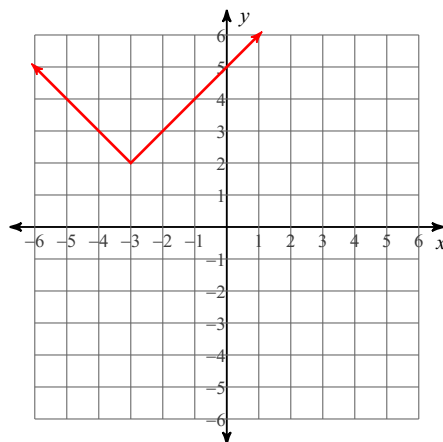
## Average Rate of Change

Find the average rate of change over  $[-5, 1]$ .

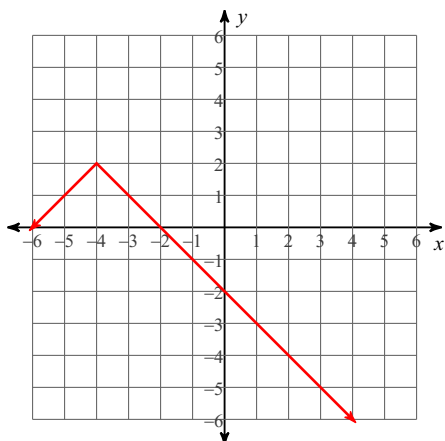
1)  $f(x) = -x^2 - 4x - 2$



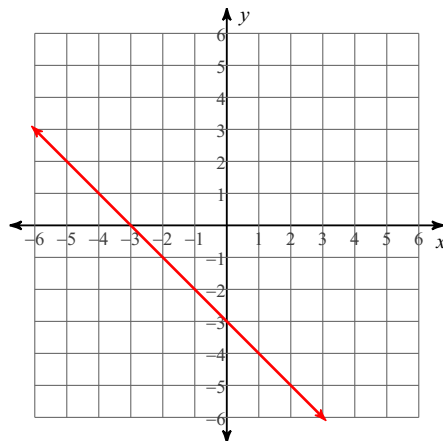
2)  $y = |x + 3| + 2$



3)  $y = -|x + 4| + 2$



4)  $x + y = -3$



5) Consider the quadratic function  $f(x) = x^2 + 2x - 1$ . Calculate the average rate of change of this function over the following intervals:

(a)  $[0, 2]$

(b)  $[2, 4]$

(c)  $4 \leq x \leq 6$

(d) Clearly the average rate of change is getting larger as  $x$  gets larger. How is this reflected in the graph of the function?

- 6) For the function  $g(x)$  given in the table below, calculate the average rate of change for each of the following intervals.

$x$	-3	-1	4	6	9
$g(x)$	8	-2	13	12	5

(a)  $[-3, -1]$

(b)  $[-1, 6]$

(c)  $[-3, -9]$

(d) Explain how you can tell from the answers in (a) through (c) that this is not a table that represents a linear function.

- 7) A box is to be made out of a rectangular piece of card board that is 2 feet long and 3 feet wide. Squares  $x$  feet on a side are cut out of the corners and the sides are bent upward.

a) Write an expression for the length and width of the base of the newly formed box.

b) Write an expression giving the volume of the box.

### Convert to interval notation

8) a)  $3 \leq x < 5$

b)  $x \leq 6$

c)  $x > -4$