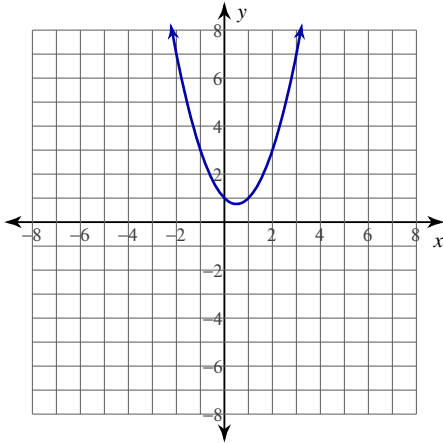


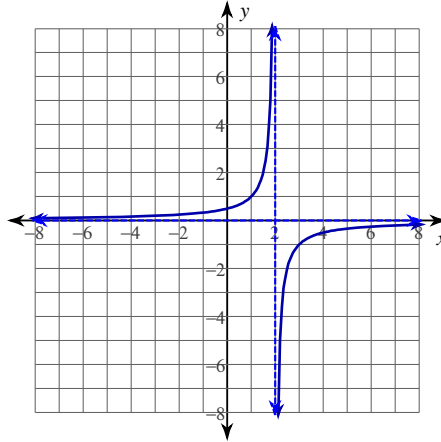
## Average Rates of Change

For each problem, find the average rate of change of the function over the given interval.

1)  $y = x^2 - x + 1$ ;  $[0, 3]$

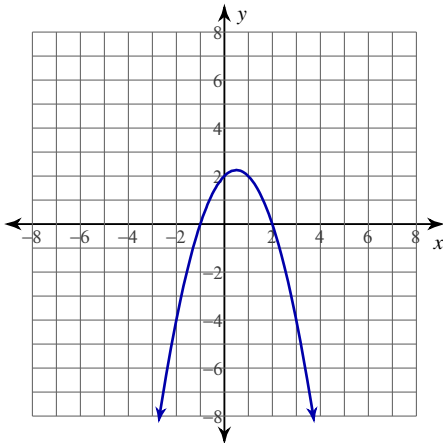


2)  $y = -\frac{1}{x-2}$ ;  $[-3, -2]$

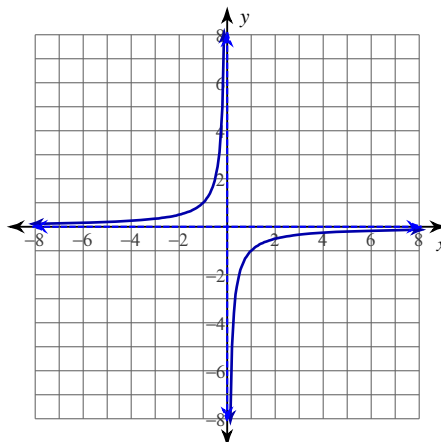


For each problem, find the equation of the secant line that intersects the given points on the function.

3)  $y = -x^2 + x + 2$ ;  $(-2, -4)$ ,  $(1, 2)$



4)  $y = -\frac{1}{x}$ ;  $(1, -1)$ ,  $(3, -\frac{1}{3})$



**For each problem, find the average rate of change of the function over the given interval.**

5)  $y = x^2 + 2$ ;  $[-2, -\frac{3}{2}]$

6)  $y = 2x^2 - 2x + 1$ ;  $[-1, -\frac{1}{2}]$

7)  $y = -\frac{1}{x+2}$ ;  $[-1, -\frac{1}{2}]$

8)  $y = 2x^2 + x + 2$ ;  $[0, \frac{1}{2}]$

**For each problem, find the equation of the secant line that intersects the given points on the function.**

9)  $y = -x^2 - 2$ ;  $(1, -3), (\frac{3}{2}, -\frac{17}{4})$

10)  $y = \frac{1}{x+3}$ ;  $(-1, \frac{1}{2}), (-\frac{1}{2}, \frac{2}{5})$

11)  $y = \frac{1}{x-1}$ ;  $(-2, -\frac{1}{3}), (-\frac{3}{2}, -\frac{2}{5})$

12)  $y = -\frac{1}{x}$ ;  $(1, -1), (\frac{3}{2}, -\frac{2}{3})$

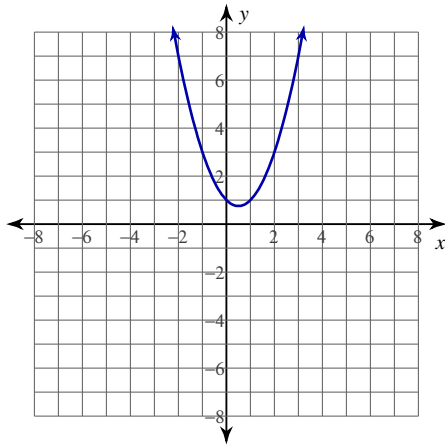
**Critical thinking question:**

- 13) The police have accused a driver of breaking the speed limit of 60 miles per hour. As proof, they provide two photographs. One photo shows the driver's car passing a toll booth at exactly 6 PM. The second photo shows the driver's car passing another toll booth 31 miles down the highway at exactly 6:30 PM. Does the photo evidence prove that the driver broke the speed limit during this time?

## Average Rates of Change

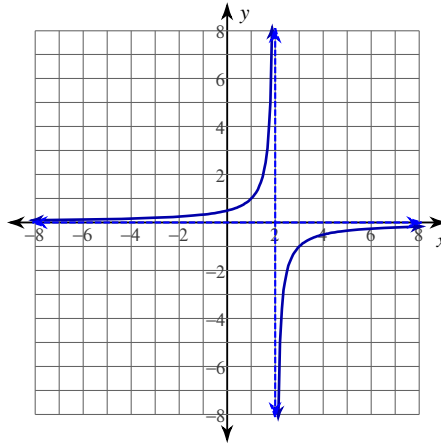
For each problem, find the average rate of change of the function over the given interval.

1)  $y = x^2 - x + 1$ ;  $[0, 3]$



2

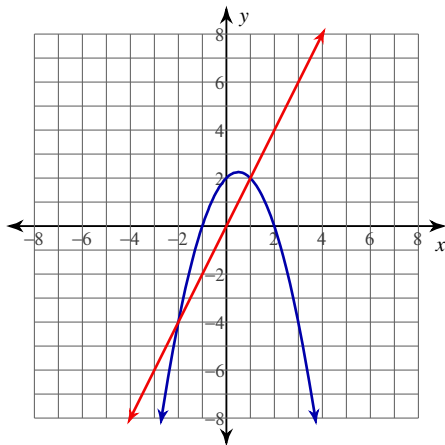
2)  $y = -\frac{1}{x-2}$ ;  $[-3, -2]$



$\frac{1}{20}$

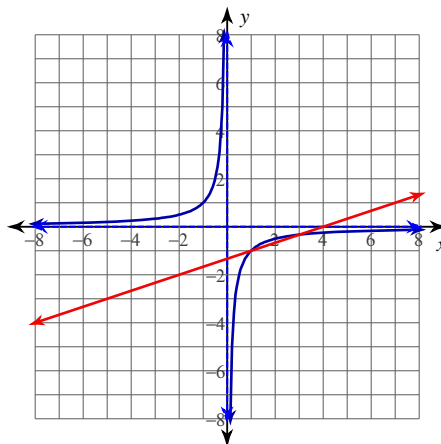
For each problem, find the equation of the secant line that intersects the given points on the function.

3)  $y = -x^2 + x + 2$ ;  $(-2, -4), (1, 2)$



$y = 2x$

4)  $y = -\frac{1}{x}$ ;  $(1, -1), (3, -\frac{1}{3})$



$y = \frac{1}{3}x - \frac{4}{3}$

For each problem, find the average rate of change of the function over the given interval.

5)  $y = x^2 + 2$ ;  $[-2, -\frac{3}{2}]$

$$-\frac{7}{2}$$

6)  $y = 2x^2 - 2x + 1$ ;  $[-1, -\frac{1}{2}]$

$$-5$$

7)  $y = -\frac{1}{x+2}$ ;  $[-1, -\frac{1}{2}]$

$$\frac{2}{3}$$

8)  $y = 2x^2 + x + 2$ ;  $[0, \frac{1}{2}]$

$$2$$

For each problem, find the equation of the secant line that intersects the given points on the function.

9)  $y = -x^2 - 2$ ;  $(1, -3), (\frac{3}{2}, -\frac{17}{4})$

$$y = -\frac{5}{2}x - \frac{1}{2}$$

10)  $y = \frac{1}{x+3}$ ;  $(-1, \frac{1}{2}), (-\frac{1}{2}, \frac{2}{5})$

$$y = -\frac{1}{5}x + \frac{3}{10}$$

11)  $y = \frac{1}{x-1}$ ;  $(-2, -\frac{1}{3}), (-\frac{3}{2}, -\frac{2}{5})$

$$y = -\frac{2}{15}x - \frac{3}{5}$$

12)  $y = -\frac{1}{x}$ ;  $(1, -1), (\frac{3}{2}, -\frac{2}{3})$

$$y = \frac{2}{3}x - \frac{5}{3}$$

**Critical thinking question:**

- 13) The police have accused a driver of breaking the speed limit of 60 miles per hour. As proof, they provide two photographs. One photo shows the driver's car passing a toll booth at exactly 6 PM. The second photo shows the driver's car passing another toll both 31 miles down the highway at exactly 6:30 PM. Does the photo evidence prove that the driver broke the speed limit during this time?

**Yes. The average rate of change is 62 mph, so the driver must have been breaking the speed limit some of the time.**