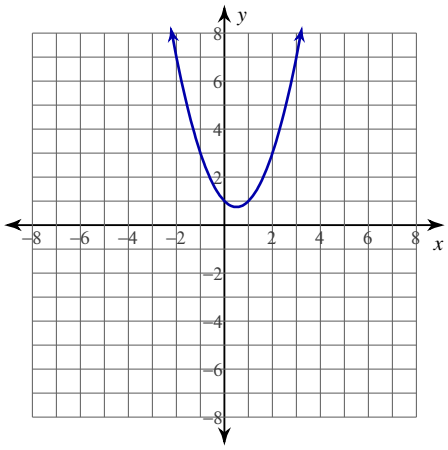
Kuta Software - Infinite Calculus Name_____

Average Rates of Change

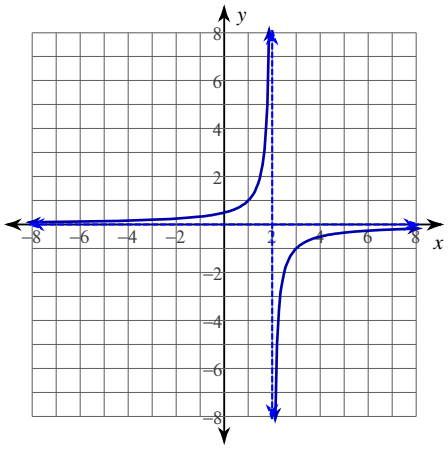
Date_____ Period____

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

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

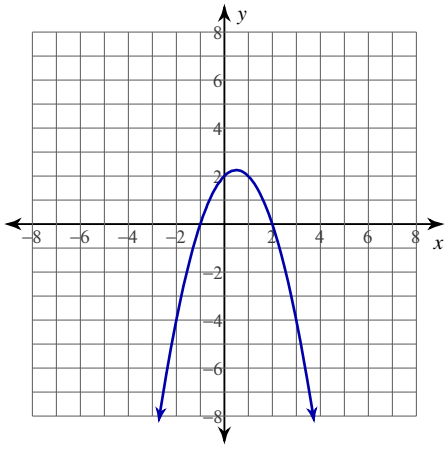


2) $y = -\dfrac{1}{x-2}$; $[-3, -2]$

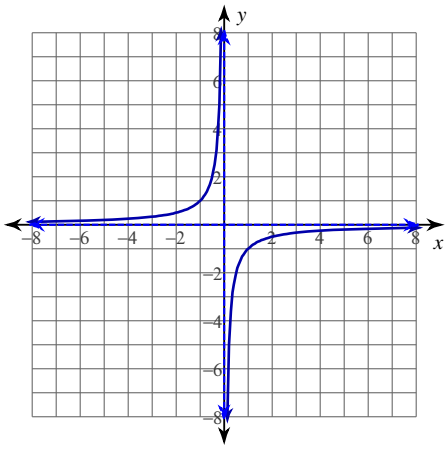


For each problem, find the equation of the secant line that intersects the given points on the function.

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



4) $y = -\dfrac{1}{x}$; $(1, -1), \left(3, -\dfrac{1}{3}\right)$



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

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

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

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

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

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

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

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

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

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

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?

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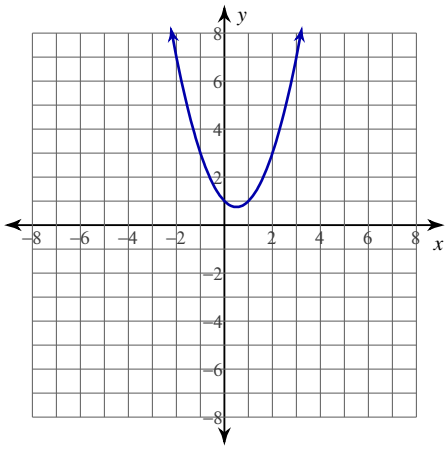
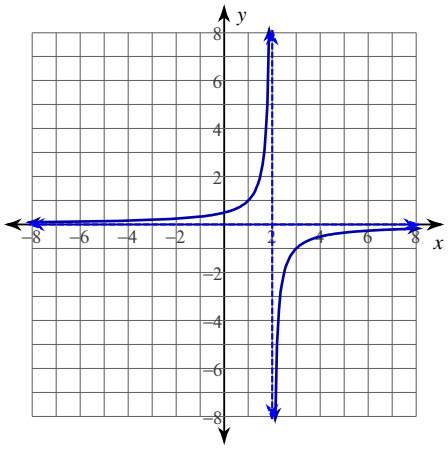
1) $y = x^2 - x + 1$; $[0, 3]$



2

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



$\dfrac{1}{20}$

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

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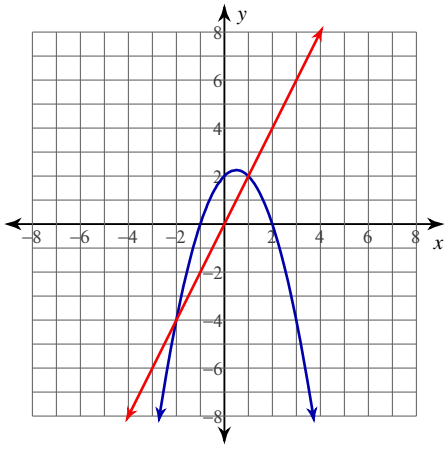
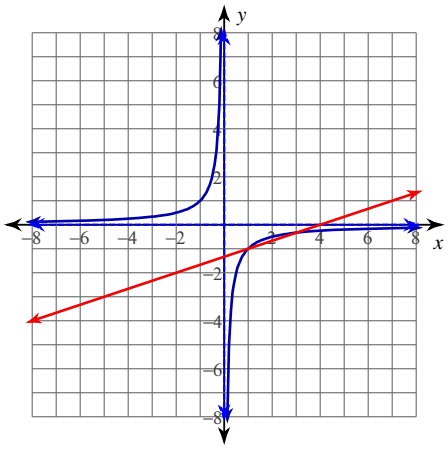


$y = 2x$

4) $y = -\dfrac{1}{x}$; $(1, -1), \left(3, -\dfrac{1}{3}\right)$



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

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

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

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

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

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

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

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

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

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.