Name_____

Instantaneous Rates of Change

Date_____ Period____

For each problem, find the average rate of change of the function over the given interval and also find the instantaneous rate of change at the leftmost value of the given interval.

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

2) $y = -\frac{1}{x-3}$; $[0, \frac{1}{2}]$

For each problem, find the equation of the secant line that intersects the given points on the function and also find the equation of the tangent line to the function at the leftmost given point. Sketch both lines for comparison.

3) $y = x^2 + x + 2$; $(-1, 2), \left(-\frac{1}{2}, \frac{7}{4}\right)$

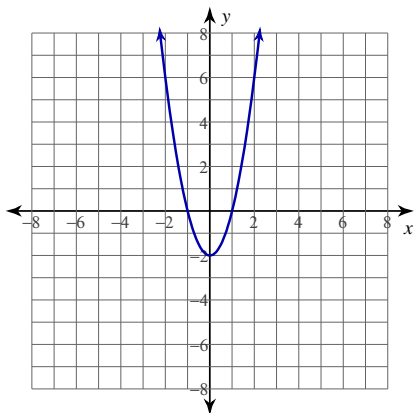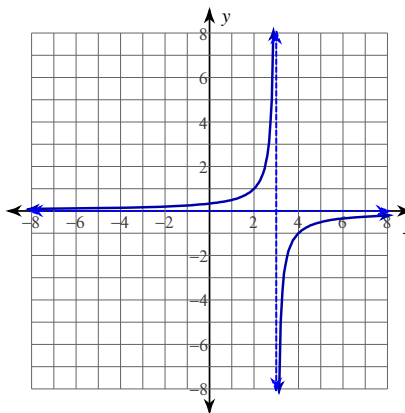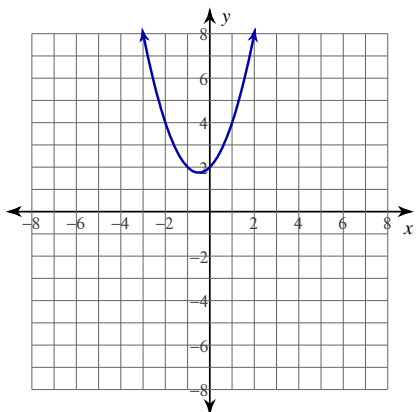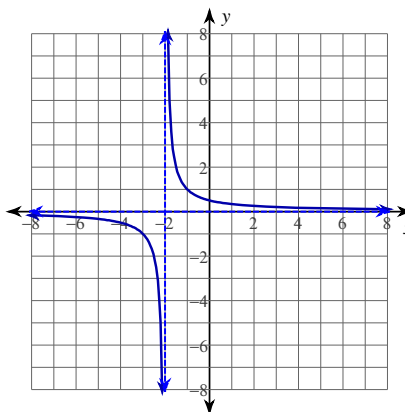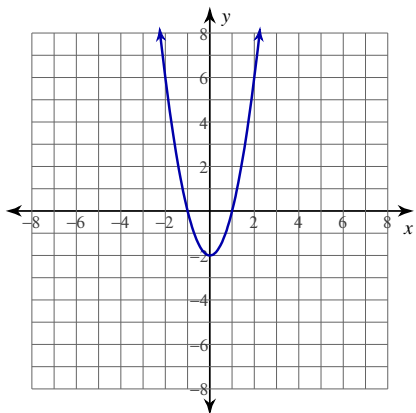4) $y = \frac{1}{x+2}$; $(-1, 1), \left(-\frac{1}{2}, \frac{2}{3}\right)$
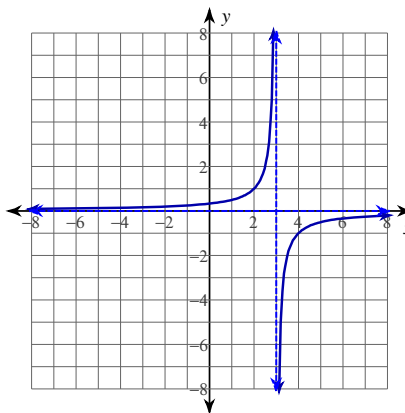
Instantaneous Rates of Change

For each problem, find the average rate of change of the function over the given interval and also find the instantaneous rate of change at the leftmost value of the given interval.

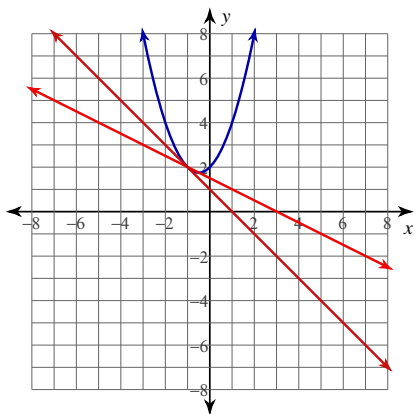1) $y = 2x^2 - 2; \ [1, \frac{3}{2}]$

Average: 5   Instant.: 4

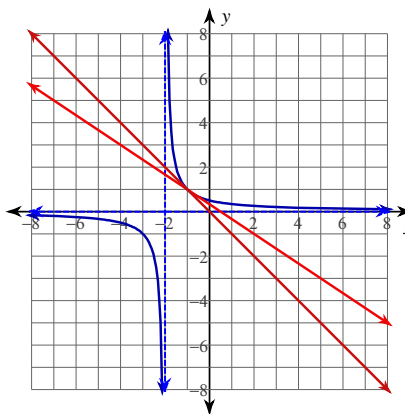2) $y = -\frac{1}{x-3}; \ [0, \frac{1}{2}]$

Average: $\frac{2}{15}$ Instant.: $\frac{1}{9}$

For each problem, find the equation of the secant line that intersects the given points on the function and also find the equation of the tangent line to the function at the leftmost given point. Sketch both lines for comparison.

3) $y = x^2 + x + 2; \ (-1, 2), \left(-\frac{1}{2}, \frac{7}{4}\right)$

Secant: $y = -\frac{1}{2}x + \frac{3}{2}$ Tangent: $y = -x + 1$

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

Secant: $y = -\frac{2}{3}x + \frac{1}{3}$ Tangent: $y = -x$