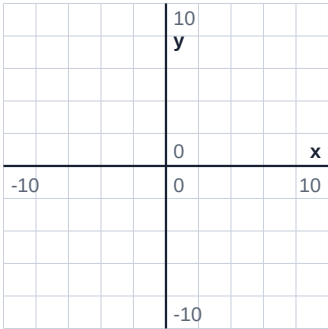


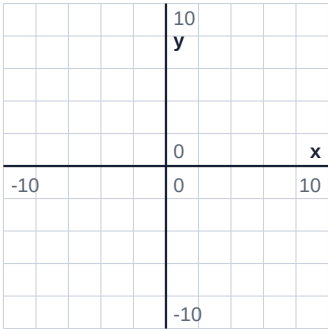
Instantaneous and Average Rate of Change

Find average change on [a,b] and instantaneous change at a. Round final nonterminating values to 3 decimals.

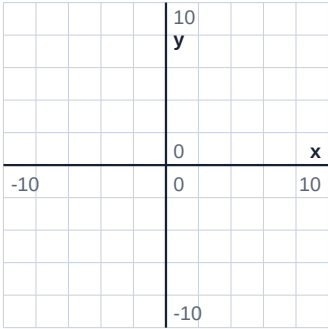
1. $f(x) = -x^2-3x-5; [0, 1]$



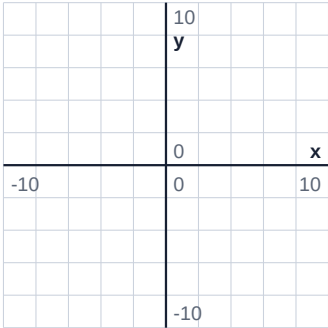
2. $f(x) = (1)/(x-2); [1, 3]$



3. $f(x) = -x^2+2x+1; [0, 1]$



4. $f(x) = 4\sin(2/7x+6); [0, 2]$



Instantaneous and Average Rate of Change

Answer Key

Find average change on $[a,b]$ and instantaneous change at a . Round final nonterminating values to 3 decimals.

1. $f(x) = -x^2 - 3x - 5$; $[0, 1]$

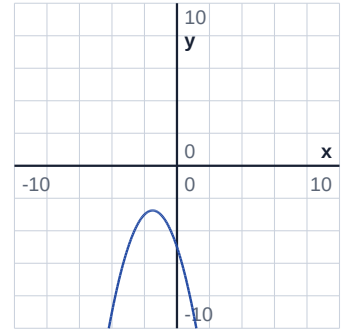
$$f(0) = -5; f(1) = -9$$

$$(f(1) - f(0))/(1) = -4$$

$$f'(0) = -3$$

$$\text{Average: } -4$$

$$\text{Instantaneous: } -3$$



2. $f(x) = (1)/(x-2)$; $[1, 3]$

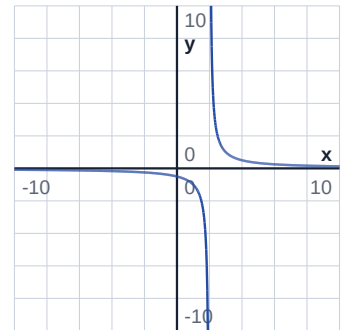
$$f(1) = -1; f(3) = 1$$

$$(f(3) - f(1))/(2) = 1$$

$$f'(1) = -1$$

$$\text{Average: } 1$$

$$\text{Instantaneous: } -1$$



3. $f(x) = -x^2 + 2x + 1$; $[0, 1]$

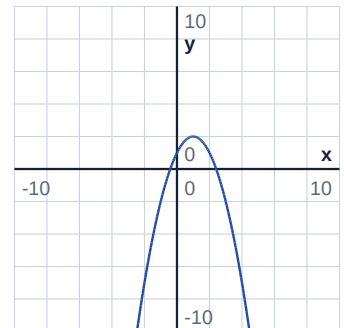
$$f(0) = 1; f(1) = 2$$

$$(f(1) - f(0))/(1) = 1$$

$$f'(0) = 2$$

$$\text{Average: } 1$$

$$\text{Instantaneous: } 2$$



4. $f(x) = 4\sin(2/7x + 6)$; $[0, 2]$

$$f(0) = 4\sin(2/7(0) + 6); f(2) = 4\sin(2/7(2) + 6)$$

$$(f(2) - f(0))/(2) = (4\sin(2/7(2) + 6) - 4\sin(2/7(0) + 6))/2$$

$$f'(0) = 8/7\cos(2/7(0) + 6)$$

$$\text{Average: } (4\sin(2/7(2) + 6) - 4\sin(2/7(0) + 6))/2 \approx 1.127$$

$$\text{Instantaneous: } 8/7\cos(2/7(0) + 6) \approx 1.097$$

