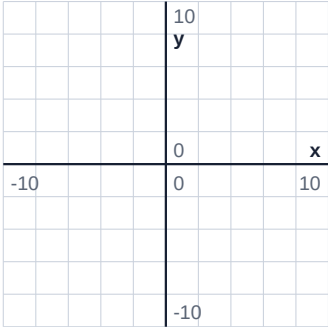


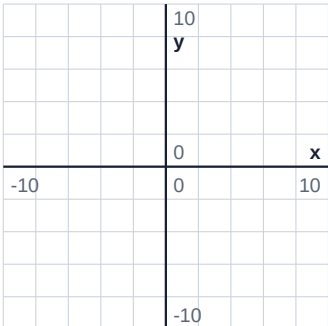
Instantaneous and Average Rate of Change

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

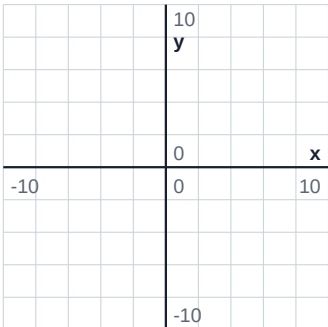
1. $f(x) = -x^2-3x-5; [0, 1]$



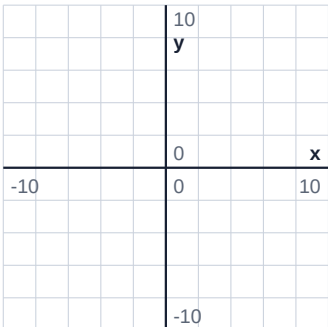
2. $f(x) = (1)/(x-2); [1, 3]$



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

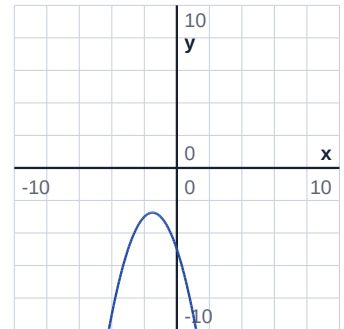
$f(0) = -5; f(1) = -9$

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

$f'(0) = -3$

Average: -4

Instantaneous: -3



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

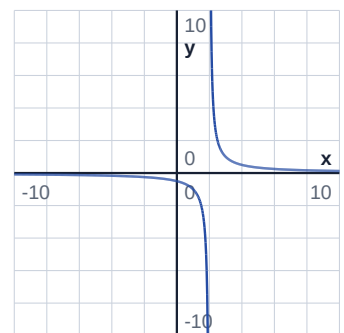
$f(1) = -1; f(3) = 1$

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

$f'(1) = -1$

Average: 1

Instantaneous: -1



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

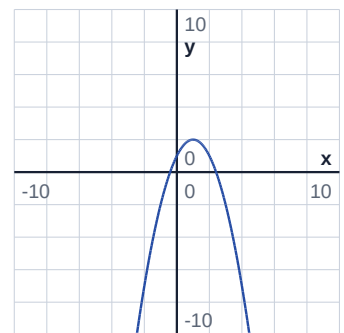
$f(0) = 1; f(1) = 2$

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

$f'(0) = 2$

Average: 1

Instantaneous: 2



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

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

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

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

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

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

