

Name: _____ Academic Integrity Signature: _____

I have abided by the UNCG Academic Integrity Policy.

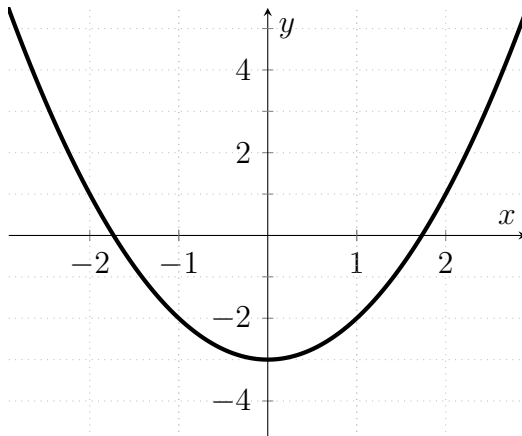
Note: Correct numerical answers without justification will receive little or no credit.

1. (3 points) (Definition) The *average rate of change* of $y = f(x)$ with respect to x over the interval $[x_1, x_2]$ is

Solution:

$$\frac{\Delta y}{\Delta x} = \frac{f(x_2) - f(x_1)}{x_2 - x_1}.$$

2. (3 points) Compute the average rate of change for $y = f(x)$ shown below on the interval $[-2, 0]$.



Solution:

$$\frac{\Delta y}{\Delta x} = \frac{f(x_2) - f(x_1)}{x_2 - x_1} = \frac{f(0) - f(-2)}{0 - (-2)} = \frac{-3 - 1}{0 - (-2)} = -2.$$

3. (4 points) (Definition) The derivative of a function f at a , denoted $f'(a)$, is

Solution:

$$f'(a) = \lim_{h \rightarrow 0} \frac{f(a+h) - f(a)}{h}$$