Name: ———————————————————————— **Section:** —————

Names of collaborators: ————————————————————————

Main Points:

1. Average value of a continuous function over an interval

2. MVT for integrals

Exercises.

1. Read Section 6.5, up to but not including Example 1. Finish the sentence with the formula in the red box: The average value of a continuous function f on an interval $[a, b]$ is ...

2. Read Example 1. Find the average value of $f(x) = 1 - x^2$ on the interval $[-1, 1]$.

3. Read about the MVT for integrals, and the geometric interpretation of the MVT for integrals. Read Example 2. Consider, as above, the function $f(x) = 1 - x^2$ on the interval $[-1, 1]$.

   (a) Find all numbers c in the interval $[-1, 1]$ such that $f(c) = f_{\text{ave}}$.

   (b) Sketch the graph of f and a rectangle whose area is the same as the area under the graph of f.

4. Consider the function $f(x) = 4x - x^2$ on $[0, 4]$.

   (a) Find the average value of f on the interval.

   (b) Find all numbers c in the interval such that $f_{\text{ave}} = f(c)$.

   (c) Sketch the graph of f and a rectangle whose area is the same as the area under the graph of f.

5. Find the average value of $f(x) = 1/x$ on the interval $[1, 3]$.

6. Find the average value of $f(x) = x^2\sqrt{1 + x^3}$ on the interval $[0, 2]$.