Name: _____ **Section:** _____

Names of collaborators: _____

Main Points:

1. Average value of a continuous function over an interval
2. MVT for integrals

Exercises.

1. Read p 451-452, 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 the rest of p 452, 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 $[0, 2]$.