

## Math 206 Project 4

First Submission due Sunday 9 March 2014 at 6:00pm

Second Submission due Monday 10 March 2014 at 6:00pm

Third Submission due Wednesday 12 March 2014 at 6:00pm

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### What to Submit:

For this project you will need to create and submit three function m-files.

### Grading Method:

For grading we will run a variety of data through your function m-files. Each m-file will earn credit based up how many correct values it returns. For example if we test it on 10 sets of input and it returns 7 correct values it would earn 70%.

### Important Note:

Your functions should print absolutely nothing and should only return the value requested. The returned value will be displayed automatically as a result of being returned from the function.

### Sample Data:

See the sample data (also in this directory) to see some sample input and output.

### The Function M-Files:

1. `myderivative(f,a,tol)` which takes three inputs: [35 pts]

**f:** A function handle for a function of **x**.

**a:** A real number.

**tol:** A real number assumed to be very small and positive.

Approximates  $f'(a)$  by finding  $\frac{f(a+h)-f(a)}{h}$  for  $h = 1, \frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \dots$  until successive values differ by less than **tol**.

Returns: The final approximation.

2. `myleftsum(f,a,b,n)` which takes four inputs: [30 pts]

**f:** A function handle for a function of **x**.

**a:** A real number.

**b:** A real number larger than **a**.

**n:** A positive integer.

Finds the left sum for  $f(x)$  on the interval  $[a, b]$  with  $n$  subintervals.

3. `myintegral(f,a,b,tol)` which takes four inputs: [35 pts]

**f:** A function handle for a function of **x**.

**a:** A real number.

**b:** A real number larger than **a**.

**tol:** A real number assumed to be very small and positive.

Approximates  $\int_a^b f(x) dx$  by taking successive left sums with  $n = 1, 2, 3, \dots$  subintervals until successive values differ by less than **tol**.

Returns: The final approximation.