

The test is open textbook and two 8.5x11 handwritten pages only. You are asked to write a program in MATLAB.

Problem:

Write a program that approximately finds the value of the integral $\int_a^b f(x)dx$ by using the following formula

$$\int_a^b f(x)dx \approx \frac{b-a}{n+1} \left[\sum_{i=0}^n f(a+ih) \right],$$

where

$$h = \frac{b-a}{n}$$

(1)

Specifications: In a single worksheet, write the following program

- A. Write a function *my_own_integral* with inputs *n*, *a*, *b* and an inline function, *f* and the output as the approximate value of the integral. Use a *for* OR *while* loop to calculate the value of the integral using the formula given in equation (1). Be sure to put your name and section number as comments.
- B. In a separate mfile called *integral_test*, do the following and use *disp* command to identify each part
 - a. *disp* your name and section number
 - b. Test the function for $\int_{3.4}^6 2e^{-0.3x} dx$ with *n*=5
 - c. Test the function for $\int_{3.4}^6 2e^{-0.3x} dx$ with *n*=29
 - d. Compare the value with the exact value of $\int_{3.4}^6 2e^{-0.3x} dx$