MATH 152 Assignment 4, Fall 2026.

Webassign Exercises

7.4 Exercises 7, 15, 19, 28.

7.5 Exercises 1, 4.

7.7 Exercises 16, 30.

7.8 Exercises 5, 7, 9, 27.

Written Exercises

Use the formula sheet (on Canvas) for this assignment as needed.
Please upload your solution to each question to the corresponding crowdmark box.
Just put your name and student ID number on your answer to question 1.

1 (Section 7.4) Calculate $\displaystyle\int \frac{x-4}{x^2-5x+6}dx$.

2 (Section 7.4) Calculate $\displaystyle\int \frac{3x^2+2x+1}{(x+1)(x^2+1)}dx$.

3 (Section 7.5) Calculate $\displaystyle\int \frac{e^{2x}}{(1+e^x)}dx$.
First use a substitution to get rid of the exponential.

4 (Section 7.5) Calculate $\displaystyle\int \ln(1+x^2)dx$.
First use integration by parts to get rid of the logarithm.

5 Section 7.7 Exercise 21. To save some work for part (a), use $n = 6$ not $n = 10$.
You should get $T_6 = 1.954097, M_6 = 2.023030$ and $S_6 = 2.000863$.
The answers to part (c) are in the back of the textbook. Show you working.

6 (Section 7.7) For $f(x) = e^{-x^2}$ consider $A = \int_0^1 e^{-x^2}dx = 0.7468241328$.

(a) Let $K = \max_{0\le x\le 1} f''''(x)$. Get Wolfram Alpha to calculate $f''''(x)$ and graph $f''''(x)$. From the graph and the formula for $f''''(x)$) determine K. Don't submit a screenshot.

(b) Now use the error bound for Simpson's rule on page 537 to bound the number of subintervals n so that the error $|E_S|$ in Simpson's rule is $\le 10^{-6}$.

7 (Section 7.8) Evaluate the improper integral $\int_1^\infty \frac{dx}{x^2+x}$.
Note, it must be convergent because $\frac{1}{x^2+x} < \frac{1}{x^2}$ for $x \ge 1$ and $\int_1^\infty \frac{dx}{x^2} = 1$.

Wolfram Alpha exercises.

8 (Section 5.2) Use Wolfram Alpha to calculate the definite integral $\int_{-\pi}^{\pi} \sin(3x)dx$.

You will get $\int_{-\pi}^{\pi} \sin(3x)dx = 0$ and a graph of $\sin(3x)$ on $[-\pi, +\pi]$. Upload a screenshot of this. From the graph, in one or two sentences, explain why $\int_{-\pi}^{\pi} \sin(3x)dx = 0$.

Reference: see Figures 3 and 4 an the text above them on page 385 of the textbook.

9 (Section 7.8) Use Wolfram Alpha to calculate $\int_0^\infty x^n e^{-x}dx$ for $n = 1, 2, 3, 4, 5$. Upload a screen shot for $n = 5$ only. From the values you get, what is $\int_0^\infty x^n e^{-x}dx$?

Midterm 2 is on Wednesday October 28th in class.

It covers the material covered on Assignments 3 and 4 so sections 6.5, 7.1−7.5, 7.7, and 7.8.