MATH 152 Assignment 4, Spring 2024.

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

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 $\int_0^1 \frac{x-4}{x^2-5x+6} dx$. I get $\ln 3 - 3\ln 2$.

2 (Section 7.4) Calculate $\int_0^1 \frac{3x^2+2x+1}{(x+1)(x^2+1)} dx$. I get $2\ln 2$.

3 (Section 7.5) Calculate $\int_0^{\pi/2} 2\sin^2 x \sin(2x) dx$. I get 1.
First try to simplify the integrand.

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

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

6 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.

7 (Section 7.7) There is a relation between the Trapezoidal rule T_n, the Midpoint rule M_n and
Simpson's rule S_n, namely,
$$\frac{1}{3}T_n + \frac{2}{3}M_n = S_{2n}.$$
Verify this for $n=1$.

8 (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 $x \geq 1$ and $\int_1^\infty \frac{dx}{x^2} = 1$.

9 (Section 7.8) Evaluate the improper integral $\int_0^1 t\ln t\, dt$.

Midterm 2 is on Friday March 1st in class.

It covers the material covered on Assignments 3 and 4 which is Sections 6.5, 7.1−7.5, 7.7, and 7.8.