MATH 152 Assignment 3, Fall 2026.

Webassign Exercises

6.5 Exercises 1, 9.

7.1 Exercises 3, 5, 15, 19.

7.2 Exercises 1, 10, 45, 51.

7.3 Exercises 1, 2, 3.

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.
You are encouraged to use Wolfram Alpha to compute the answers to the questions but you must show your working – zero marks will be given for answers with no working.

1 (Section 6.5) Calculate the average of $f(x) = (1+x)^3$ on $[0, 2]$.

2 (Section 6.5) A car is travelling at $v(t) = at(2-t)$ kmph. If the average speed on $0 \le t \le 2$ is 100 kmph, what must a be?

3 (Section 7.1) Evaluate $\int e^{\sqrt{x}} dx$.
Make a substitution first then use integration by parts.

4 (Section 7.1) Calculate $\int (1+t^2)e^{-t} dt$.

5 (Section 7.2) Two functions $f(x)$ and $g(x)$ are said to be orthogonal on $[a, b]$ if

$$\int_a^b f(x)g(x)dx = 0.$$

Show that $\sin 3x$ and $\cos 2x$ are orthogonal on $[-\pi, \pi]$.

6 (Section 7.2) Let A be the area enclosed by $\sin^2 x$ and $\cos^2 x$ for $0 \le x \le \pi$. Sketch A. You will need to solve $\sin^2 x = \cos^2 x$ first. Use Wolfram Alpha as needed. Now express A as a definite integral and evaluate the integral by hand. You should get $A = 1$.

7 Section 7.3 exercise 10. Use a trig substitution.

8 Section 7.3 exercise 14. Use a trig substitution.

9 Section 7.3 exercise 18. Use a trig substitution. I get $\ln(1+\sqrt{2})$.

10 For practice, calculate the following indefinite integrals:
(a) $\int \frac{dx}{(1+x)^2}$ (b) $\int \frac{dx}{1-x}$ (c) $\int \frac{dx}{1+2x}$ (d) $\int \frac{dx}{\sqrt{1+x}}$.