MATH 152 Assignment 1, Fall 2026.

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There are two sets of exercises to do for each assignment. Some Webassign exercises on the computer and some written exercises. You must do both sets of exercises.

WebAssign Exercises

These are to be done on the computer using Webassign. You'll need a Cengage account. The Webassign exercises correspond to the textbook exercises below but they will be numbered differently and some will be randomized.

4.9 Exercises 6, 18, 37, 45

5.1 Exercises 3, 24

5.2 Exercises 27, 35, 41, 53

5.3 Exercises 3, 9, 35, 63

Written Exercises

These are to be done on paper or on a tablet. When you upload your solutions to Crowdmark, please upload your solutions to the right Crowdmark box. This is to help the markers find your solutions. The penalty for late written assignments is 10% per hour late.

1 Differentiate the following functions of x.
(a) $3x^2 + 2x^{-1}$, (b) $\ln(1-x) + xe^{-2x}$, (c) $\sqrt{1+x^2}$, and (d) $\sin(2x) - \cos x/x$.

2 (Section 4.9) A car is travelling at velocity $v(t) = 10t(6-t)$ kmph.

(a) What is the maximum velocity of the car on $0 \le t \le 6$?

(b) How far does the car travel on $0 \le t \le 6$?

Use a derivative to answer (a) and an antiderivative for (b).

3 (Section 4.9) A car is travelling at 72 kmph. If the driver hits the brakes and decelerates at a constant rate of 10 m/s^2, how long will it take before the car stops and how far will the car travel before it stops. Note: 72 kmph = 20 m/s.

4 (Section 5.1)

(a) Estimate the area under the graph of $f(x) = 4 - x^2$ from $x = -1$ to $x = 2$ using three approximating rectangles of width 1 and right end points.

(b) Repeat part(a) using left endpoints.

(c) Repeat part(a) using midpoints.

5 (Section 5.1)

(a) Let $f(x) = 1 + x$ and A be the area bounded by $f(x)$, the x axis, $x = 0$ and $x = 2$. Sketch A and use the formula for the area of a trapezoid to calculate A.

(b) Construct the formula for R_n (the area of n right rectangles) in sigma notation for the area A in part (a). Simplify the formula and evaluate $\lim_{n\to\infty} R_n$. Show your working.

6 (Section 5.2) Evaluate the following sums :

(a) $\sum_{i=1}^{5}(2i-1)$, (b) $\sum_{i=1}^{n}(4i-2)$ and (c) $\sum_{k=1}^{n-1} 6k^2/n$.

7 (Section 5.2) If $\int_0^2 f(x)dx = 3$ and $\int_0^2 g(x)dx = 1$ calculate $\int_0^2 (3f(x) - 2g(x))\, dx$. See Properties of the Definite Integral.

8 (Section 5.3) Evaluate $\int_1^9 \frac{3}{\sqrt{z}}dz$ using the Fundamental Theorem of Calculus.

9 (Section 5.3) Express the area in question **4** as a definite integral then evaluate the definite integral using the Fundamental Theorem of Calculus. Which estimate of (a), (b), (c) in question 4 is the most accurate?

10 (Section 5.3) Show that $\int_a^b f(x)g(x)dx \neq \left(\int_a^b f(x)dx\right)\left(\int_a^b g(x)dx\right)$ in general.
Hint: Consider $\int_0^1 x(1-x)dx$.