

Math 102, Fall 2021 — Homework 8

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Due November 3 at 5:00 pm

Instructions. This homework, like most others this semester, has two parts. One part is on Webwork, and the other part is some problems that you will write solutions to by hand and submit on Gradescope.

Webwork

No webwork this week.

Written problems

Write up solutions to the following problems, making sure to show your work, write neatly, scan clearly, and generally follow the [guidelines for writing good homework solutions](#). You should submit solutions on [Gradescope](#).

Problem 1. Find the following values.

- $\int_3^5 x \cos x \, dx$
- $\int_1^3 t \ln t \, dt$
- The area between $y = \ln(x^2 - 1)$ and $y = \ln(x - 1)$ for values of x between 2 and 3.

Problem 2. Find the following values.

- $\int_0^1 x f''(x) \, dx$ given that f is a function such that $f(0) = 6$, $f(1) = 5$, $f'(1) = 2$.
- $\int_0^7 x f'(x) \, dx$ given that f is a function such that $f(7) = 0$ and $\int_0^7 f(x) \, dx = 5$.
- $\int_2^3 f(x)g'(x) \, dx$ given that $\int_2^3 f'(x)g(x) \, dx = 1.3$ and the following table of values.

x	$f(x)$	$f'(x)$	$g(x)$	$g'(x)$
2	5	-1	0.2	3
3	7	-2	0.1	2

Problem 3. Find the following indefinite integrals using partial fractions.

- $\int \frac{20}{25-x^2} \, dx$
- $\int \frac{2(1+x)}{x(x^2+3x+2)} \, dx$
- $\int \frac{3x+1}{x^2-3x+2} \, dx$

Problem 4. Find the following indefinite integrals using partial fractions.

1. $\int \frac{x-2}{x^2-x^4} dx$

2. $\int \frac{1}{x^4-x^3} dx$

3. $\int \frac{x^2-5}{x(x^2+1)} dx$