

# Math 102, Fall 2021 — Homework 2

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Due September 15 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

See [Webwork](#) for a set of problems from Sections 9.1 and 9.2.

## 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.** Give an example of:

1. An infinite geometric series that does not converge.
2. A finite geometric series with 4 distinct terms whose sum is 10.
3. An infinite geometric series that converges to 5.

**Problem 2.** Use the integral test to determine whether each of the following series converges.

1.  $\sum_{n=1}^{\infty} \frac{1}{3n^4}$
2.  $\sum_{n=1}^{\infty} \frac{1}{2\sqrt{n}}$
3.  $\sum_{n=1}^{\infty} \frac{4}{(2n)^5}$

**Problem 3.** Use any method we've learned so far to decide whether each of the following series converges. State your conjecture (converges or diverges) and explain why.

1.  $\sum_{n=1}^{\infty} \frac{1}{\ln(2^n)}$
2.  $\sum_{n=1}^{\infty} \frac{1}{(\ln(2^n))^2}$
3.  $\sum_{n=1}^{\infty} \frac{1}{e^n}$
4.  $\sum_{n=1}^{\infty} \pi^{2n}$
5.  $\sum_{n=1}^{\infty} \frac{n}{n+1}$
6.  $\sum_{n=1}^{\infty} \frac{n+1}{2n+3}$