

Written Homework 6

MATH 126

Solve each of the following problems. Work out your problems on scratch paper first, then write your solutions neatly on the pages you plan to turn in. Write the problems in assigned order, with each problem clearly labeled. Use words to clearly explain your work and methods. The reader should never have to guess or infer your intentions.

For a brief guide to writing homework solutions, see *Writing Mathematics Well* from Harvey Mudd College.

Scan or photograph your solutions and submit them (as a single file) to the Written Homework 6 assignment on Moodle. This assignment is due at classtime on **Friday, October 10**.

1. Give an example of a sequence that diverges, but *not* with an infinite limit. Explain.
2. Give an example of a sequence that converges to 5.
3. Find a formula for the general term a_n of the sequence $\{2, -1, \frac{1}{2}, -\frac{1}{4}, \frac{1}{8}, -\frac{1}{16}, \dots\}$.
4. Find a formula for the general term a_n of the sequence $\{2, \frac{4}{3}, \frac{8}{9}, \frac{16}{27}, \frac{32}{81}, \dots\}$.
5. Give an example of a strictly decreasing sequence (that is, each term is smaller than the previous term) that converges to 100. Use a formula or words (or both!) to describe the n th term of your sequence.
6. Suppose that \$150 is deposited each year into an account that earns 2% interest, compounded annually. Let A_n be the amount of money in the account immediately after the n th deposit.
 - (a) Explain why $A_n = 150 + 150(1.02) + 150(1.02)^2 + \dots + 150(1.02)^{n-1}$. What type of series is this? How do you know?
 - (b) Compute the value of the account after the 30th deposit. (Don't do this actually adding up 30 terms. Instead, use a formula from Section 8.2 in *Active Calculus*.)
7. Express $0.0808\overline{08}$ as a geometric series. Then use the geometric series sum formula to find a fraction equal to $0.0808\overline{08}$.