

MATH1007

Homework 2

Due Friday, September 16

When submitting homework, please remember the following:

- Show all work leading to each solution.
- *You must use a staple* (not paper clip) if your answers are longer than a single page.
- Do not submit crossed-out or sloppy work.
- Do not submit ripped or torn pages.
- Be sure to submit your own work.

1. What is the sum of all numbers from 1 to 100 which are *not* multiples of 3? In other words, what is the sum of $1 + 2 + 4 + 5 + 7 + 8 + \cdots + 98 + 100$?
2. Nirvana Corporation manufactures widgets, and currently has 311 in stock. Nirvana plans to manufacture and store 14 widgets per week for the next 75 weeks. The storage cost is \$0.07/widget/week. This means that at the end of week 1, there are 325 widgets in stock, and the storage cost for that week is $325 \cdot 0.07$. What is the cost of storing all of these widgets for 75 weeks?
3. A population decreases according to the formula $P_n = 0.8P_{n-1}$ with $P_0 = 3456$. What is the smallest value of n for which $P_n < 200$?
4. Suppose that $P_0 = 13.4$ and $P_1 = 14.3$.
 - (a) If this is a sequence with linear growth, compute P_5 .
 - (b) If this is a sequence with exponential growth, compute P_5 .
5. Suppose that you own a stock worth \$655.
 - (a) Suppose that the stock price increases 10% daily for 5 days. What is the stock price at the end of those 5 days?
 - (b) Suppose instead that the stock price starts at \$655 and increases 5% daily for 10 days. What is the stock price at the end of those 10 days?
6. According to Wikipedia, the population of England was 7,754,875 people on January 1, 1801 and 8,762,178 people on January 1, 1811.
 - (a) Assume that the population grew linearly. What was the first year in which the population was larger than 10 million on January 1?
 - (b) Assume that the population grew exponentially. What was the first year in which the population was larger than 10 million on January 1?
7. Suppose that you deposit \$750 in a bank account paying 5.34% annual interest, compounded annually. How many months must pass before the account will have more than \$900?
8. Suppose that you deposit \$750 in a bank account paying 5.34% annual interest, compounded monthly. How many months must pass before the account will have more than \$900?

9. Suppose that you deposit \$800 in a bank account paying compound interest, compounded monthly, at some unknown rate. Suppose that in 20 months, the account has \$900. What is the APR for the account? What is the APY?