Math 110 - Section 3
Exam #4 - Sample study problems

Very important: These problems do not outline everything that will or will not be on the exam! They should be similar, however the goal of the exam is to test understanding - not regurgitation.

1. True or false: $\sum_{n=1}^{200} \ln(n) = \ln(200!)$
2. Compute $\sum_{n=1}^{90} \left(\frac{1}{10}n + 36(5^{-(n-1)})\right)$
3. Consider the sequence defined by

$$b_n = \begin{cases} 3 & \text{for } n = 1 \\ (b_{n-1} - 1)^2 & \text{for } n = 2, 3, 4, \ldots \end{cases}$$

   Find the 4th term of the sequence
4. What type of sequence is $11, 8, 5, 2, -1, \ldots$?
5. Find $40 + 20 + 10 + 5 + \cdots + \frac{5}{8}$ using sum formulas.
6. If $\sum_{k=1}^{42} 2c_k = 90$, what is the value of $\sum_{k=1}^{42}(3c_k - 1)$?
7. If b is a geometric sequence in which $b_2 = 15$ and $b_4 = \frac{27}{5}$, find the common ratio and find a formula for b_n:
8. Compute $\sum_{k=1}^{\infty} 4\left(\frac{7}{8}\right)^{k-1}$
9. Compute $2 + \frac{5}{2} + 3 + \frac{7}{2} + 4 + \cdots + 9$
10. Simplify the following expression using properties of the factorial:

$$\frac{k!(k^2 + 3k + 2)}{9}$$

11. Write $0.12121212\overline{12}$ as a fraction