City Semester Name:_____
Test #4
Show all work for full credit.

1. Write out the first 5 terms of each of the following sequences.

   (a) $a_n = n^2 - n$

   (b) $b_n = \dfrac{(-2)^n}{2n-1}$

   (c) $c_n = c_{n-1} - (c_{n-2})^2$ where $c_1 = 1$ and $c_2 = 2$.

2. Given an arithmetic sequence that has terms $a_1 = 5$ and $a_3 = -3$, give the general term of the sequence and find a_{50}.

3. What is the 6th term of a geometric sequence where $b_1 = 32$ and $b_3 = 2$.

4. Evaluate the following series.

(a) $\sum_{k=1}^{50}(3k-25)$

(b) $\sum_{k=1}^{8}\frac{1}{3^k}$

(c) $\sum_{k=2}^{\infty}10\left(\frac{4}{5}\right)^k$

(d) $\sum_{k=1}^{55}\ln\left(\frac{k+1}{k}\right)$.

5. You will receive 5 annual payments of $5,000 beginning 3 years from now. Assuming a constant annual discount rate of 3%, what is the present value of this series of payments?

6. You want to borrow $15,000. If your loan requires equal monthly payments at an annual rate of 4% for 3 years, find the amount you owe each month for this loan. (a reminder to show all work.)

7. Each month you deposit \$500 into an account that pays interest at a 3% annual rate compounded monthly. How much money will you have in 5 years?

8. The half-life of amoxicillin in the blood stream is 1 hour. If your doctor prescribes 500mg every 8 hours for 10 days, how much antibiotic is in your blood stream immediately after you take your last dose on the tenth day?

9. Evaluate the series $\sum_{n=5}^{35}(5n-8)$

Please write out the following statement and sign your name to it as testament to its truth. 'I have worked on this assignment for at most 60 minutes and I have neither given nor received any unauthorized help on this work'