3/4/2026 Spring 2026, Patterns in (Environmental) Math Quiz 5 Sitaraman

Howard University Math Department

Instructions:

PLEASE PROVIDE STEP BY STEP EXPLANATIONS

WRITING ONLY ANSWERS WILL NOT GET FULL CREDIT

Time Limit 30 minutes

Please read the questions carefully before answering

1. (10 points) Find the 20th term a_{20} of the following geometric sequence. You must use the formula for the n-th term a_n. You can leave answer as a fraction.
$$2, \frac{2}{3}, \frac{2}{9}, \frac{2}{27}, ...$$

2. (Extra credit 10 points) Which of the following are polynomial functions, which are exponential functions? Explain.
$$3x^7 + 4x^3 + 1, \quad x^2 + \frac{1}{x^2}, \quad 2^x, \quad \frac{1}{2^x}$$

3. (10 points) Using the compound interest formula find out how long it would take for $ 1000 to double if the interest rate is 4 percent and interest is compounded annually. In other words, when does it become 2000 dollars?

   You must use compound interest formula and logarithms.

4. (10 points) Using the same rate of interest (4 percent) and initial amount (1000 dollars) find out how much will be in the account after 18 years if interest is compounded *continuously.* How long does it take to double ? You must use compound interest formula and logarithms.