

MPS22 – Precalculus  
Exam 1 Review Sheet

*Practice Problems:*

1. Write out the first five terms of each sequence and state whether the sequence is arithmetic, geometric, or neither.  
(a)  $a_1 = -3$   
 $a_{k+1} = a_k - 8$       (b)  $a_1 = 27$   
 $a_{k+1} = \frac{3}{4}a_k$       (c)  $a_n = 2(3)^{n-1}$       (d)  $a_n = \frac{n!}{n+1}$
  
2. Evaluate each sum. Show your work.  
(a)  $\sum_{i=2}^{12} (3i-1)$       (b)  $\sum_{n=1}^{10} 4\left(\frac{1}{2}\right)^{n-1}$       (c)  $\sum_{i=1}^{\infty} 4\left(\frac{4}{5}\right)^{i-1}$
  
3. Use an infinite geometric series to express each repeating decimal as a fraction in lowest terms.  
(a) 0.36363636...      (b) 0.2511111111...      (c) 2.5123123123123...
  
4. Find the 20<sup>th</sup> term of each sequence.  
(a) 2, -8, -18, ...      (b) 4, 12, 36, ...      (c) 6, 4,  $\frac{8}{3}$ , ...
  
5. A teacher's salary starts at \$55,000 per year and increases by \$1,800 per year. How much money does the teacher earn over a 25-year career?
  
6. Reza can choose between two jobs. Job A pays \$0.01 for the first day, \$0.02 for the second day, \$0.04 for the third day, and continues to double each day. Job B pays \$10,000 per day. Which job pays more over a 20 day period? over a 30 day period? Justify your answers by computing the total amount Reza would be paid for each job over each time period.
  
7. Find an expression for  $a_n$ , the  $n$ th term in the sequence 7, 11, 15, 19, ...
  
8. A ball is dropped from top of a building that is 50 feet high. Each time it strikes the ground, it bounces up to 80% of its previous height. What is the total distance that the ball travels before it stops bouncing?
  
9. In a geometric sequence, the 6<sup>th</sup> term is 224 and the 11<sup>th</sup> term is 7,168. Find the first term and find the sum of the first 20 terms.
  
10. In an arithmetic sequence, the 60<sup>th</sup> term is -174 and the 32<sup>nd</sup> term is -90. Find the 100<sup>th</sup> term and find the sum of the first 100 terms.