SEQUENCE AND SERIES

Name:	
Date:	
My Achievement Goal for this chapter is… (Circle one) A+ A B C D	
This Assignment is:	
Good to Go	Needs Corrections

Please answer all questions on this sheet and remember to show all your work!

1. Consider the following three sequences:

   Sequence 1: $2, 5, 8, 11, 14, \ldots$
   Sequence 2: $2, 4, 8, 16, 32, \ldots$
   Sequence 3: $1, 1, 2, 3, 5, 8, \ldots$

   a. Which of the sequences above is a geometric sequence?

   b. Find the common ratio of the chosen sequence.

   c. Find the 12^{th} term of the chosen sequence.

   d. Find the sum of the first 7 terms in the chosen sequence.

   e. Express the chosen sequence as a recursive pattern.

(BONUS) What is the name of the sequence 3? Why is it famous?

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2. Write a nth term of the geometric sequence that has the given two terms:
   a. $t_2 = 4$ and $t_4 = 1$

   b. $t_2 = 9$ and $t_5 = -\frac{1}{3}$

   c. Which sequence above has a finite $t_n = ar^{n-1}$ value as n approaches infinity? Explain.

3. Show that $0.\overline{22} = \frac{2}{9}$. (Use the infinite geometric series method)

4. You drop a ball from a height of 100 metres. Each time it bounces 70% of the previous height.
   a. Write a rule for the height of the ball after the nth bounce.

   b. Find the total vertical distance of the ball has travelled when it hits the ground for the 7^{th} time? (Answer in 2 decimal places if applicable)

c. Find the total vertical distance of the ball when it stops bouncing.

5. You decide to invest $1000 at the beginning of every year. If your rate of return is 3% compounded annually, how much money will you have at the end of 5^{th} year?

6. Expand and evaluate:
   a. $\sum_{i=1}^{5} i^2$

   b. $\sum_{i=1}^{\infty} 3e^i$

   c. $\sum_{k=2}^{10} 10(3)^k$