

(A) Lesson Objectives:

- Introduce geometric sequences through several applications.
- Introduce the formulas associated with geometric sequences.
- Apply geometric sequences to real world scenarios.

(B) Exploring Patterns and Sequences

- Comment upon any common pattern you see in these sequences

(i) \$100, \$110, \$121, \$133.1, \$146.41, \$161.05,

(ii) 8, 12, 18, 27, 40.5,.....

(iii) 36, 18, 9, 4.5, 2.25,.....

(iv) 27, -9, 3, -1, 1/3,.....

- Given the sequence \$100, \$110, \$121, \$133.1, \$146.41, \$161.05 → develop a formula that you can use to predict the 407th term. EXPLAIN your prediction/formula
- Given the sequence 8, 12, 18, 27, 40.5,..... → develop a formula that you can use to predict the 1292th term. EXPLAIN your prediction/formula
- Given the sequence 36, 18, 9, 4.5, 2.25,..... → develop a formula that you can use to predict the 47th term. EXPLAIN your prediction/formula
- Given the sequence 27, -9, 3, -1, 1/3,..... → develop a formula that you can use to predict the 11th term. EXPLAIN your prediction/formula

A new provincial lottery offers two choices to the grand prize winner. Option A is a lump-sum payment of \$25 000 000. Option B is a yearly payment on the winner's birthday that starts with \$1 and doubles each year thereafter for the rest of the winner's life. Suppose you win this lottery on your 20th birthday. Which option would you choose?

Since 1967, the average annual salary of major league baseball players has risen by about 17% each year. In 1967, the average annual salary was \$19 000.

- Predict the average annual salary of a baseball player in 2007.
 - Verify your answer using graphing technology.
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(C) Key Ideas – Formula for Arithmetic Sequences

- The formula for the “general term” of an arithmetic sequence is

(D) Examples:

- a. Identify which sequences are geometric. If a sequence is geometric, determine the common ratio and the general term. Finally, determine the 20th term of the sequence.

i. 3, 15, 75, 375,

ii. 30, 6, 1.2, 0.24,.....

lii. 0.2, 0.02, 0.002, 0.002,

- b. Find the 25th term of a sequence whose first term is 50,000 and whose common ratio is 0.8. Then determine which term is the first term to be lower than 1.0

c.

For each geometric sequence, find a , r , and t_n .

(a) $t_6 = -4$, $t_7 = -20$ (b) $t_2 = 8$, $t_4 = 32$ (c) $t_4 = 54$, $t_7 = 1458$

The half-life of iodine-131 is eight days.

- (a) What will remain of 12 mg of iodine-131 after 112 days?
(b) Verify your answer using graphing technology.

Todd accepts a job with a graphic design firm. His starting salary is \$34 000, and each year he will receive an annual increase of 2.5%.

- (a) Write the sequence of his annual salary for the next five years. Start with Todd's initial salary.
(b) Determine the general term of this sequence.
(c) Determine Todd's annual salary at the end of his tenth year.

(E) Homework/Resources

- **HW: from HH Textbook** → HH Textbook, Exercise 12C, p402, Q1-4,6,8,9 (you may try Q5,7 if you wish)
- Video Help: <http://www.youtube.com/watch?v=C7tE26CDI2M&feature=relmfu>
- Video Help: <http://www.youtube.com/watch?v=IGFQXInm-co&feature=relmfu>