



Lesson 27

Working with Arithmetic & Geometric Sequences

(A) Lesson Objectives

- a. Introduce the general term for an arithmetic & geometric sequence
- b. Understand the connection between the general term and linear/exponential equations
- c. Develop proficiency with the skills & concepts associated with sequences

(B) Opening Exercise

- a. Given the sequence 8,12,16,20,24,....., develop a formula that you can use to predict the 407th term
- b. EXPLAIN your prediction/formula
- c. Given the sequence 3,6,12,24,48,....., develop a formula that you can use to predict the 41st term
- d. EXPLAIN your prediction/formula

(C) Formulas Associated with Arithmetic Sequences

- a. An example of an arithmetic sequence is →
- b. The formula associated with an arithmetic sequence is → _____, where
- c. The formula associated with linear relations is → _____ → so the similarities are

(D) Formula Associated with Geometric Sequences

- a. An example of a geometric sequence is →
- b. The formula associated with a geometric sequence is → _____, where
- c. The formula associated with exponential relations is → _____ → so the similarities are

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(E) Examples

- ex 1. Given the sequence 1, 5, 25, 125, 625.... find the next four terms
- ex 2. Given the sequence 125, 115, 105, 95.... find the next four terms
- ex 3. Given a formula, find the first 5 terms
- (i) $u_n = 3n - 2$ (ii) $u_n = n^2 - 1$ (iii) $u_n = (n-2)/(n+2)$ (iv) $u_n = 5^{n-1}$
- ex 4. Find the formula for the n th term (or the general term), then list the next three terms:
- (i) 5,10,15,20 ... (ii) 2,3,4,5,... (iii) 1,4,9,16,... (iv) 2,4,6,8,... (v) -3,-6,-12,-24... (vi) $1/2, 2/3, 3/4, 4/5, \dots$
- ex 5. Write the first 6 terms of the sequence defined by $u_n = -4 + (n - 2)3$. Find a and d
- ex 6. Given the formula for the n th term as $u_n = 8 - 2n$, find 10^{th} term.
- ex 7. Find the formula for the n th term given the arithmetic sequence 2,6,10,14,..... Then find the 17^{th} term.
- ex 8. How many terms are there in the arithmetic sequence 384, 380, 376,28, 24?
- ex 9. If the 5^{th} term of a sequence is $\frac{3}{4}$ and the 14^{th} term is 3, find a , d , and u_n and the first three terms of the sequence.
- ex 10. Write the first 6 terms of the sequence defined by $u_n = 5(-2)^{n-1}$
- ex 11. Given the formula for the n th term as $u_n = -5(4)^{n-1}$, find 10^{th} term.
- ex 12. Find the formula for the n th term given the geometric sequence 2,6,18,..... Then find the 7^{th} term.
- ex 13. How many terms are there in the geometric sequence 3,6,12,.....,384
- ex 14. If the 5^{th} term of a sequence is 1875 and the 7^{th} term is 46,875, find a , r , and u_n and the first three

(F) Video Links for Extra Help

Arithmetic Sequences:	Geometric Sequences
<ol style="list-style-type: none">http://www.youtube.com/watch?v=lj_X9JV5F8khttp://www.onlinemathlearning.com/arithmetic-sequences-nth-term.html	<ol style="list-style-type: none">http://www.onlinemathlearning.com/geometric-sequences.htmlhttp://www.onlinemathlearning.com/geometric-sequences-nth-term.htmlhttp://www.youtube.com/watch?v=C7tE26CDI2M&feature=channel

(G) Homework