CHAPTER 8: EXPONENTS & EXPONENTIAL FUNCTIONS

Arithmetic & Geometric Sequences

OBJECTIVES

- I can think reasonably to discover and continue a number pattern
- I can form arithmetic sequences
- I can form geometric sequences
- I can use formulas for arithmetic and geometric sequences

VOCABULARY

Sequence	Arithmetic Sequence	Common difference	Geometric Sequence	Common Ratio
A number pattern	Sequence formed by adding a fixed (+/-) number to each previous term	The fixed number being added in an arithmetic sequence	Sequence formed by multiplying a fixed number to each previous term	The fixed number being multiplied in an geometric sequence
EXAMPLE	EXAMPLE	EXAMPLE	EXAMPLE	EXAMPLE

NOTES
PART 1: ARITHMETIC SEQUENCES

Find the common difference of each sequence.

a. $11, 23, 35, 47, \ldots$ **b.** $8, 3, -2, -7, \ldots$

PART 1: ARITHMETIC SEQUENCES

Rule	Arithmetic Sequence

$$\underbrace{A(n)}_{\substack{n\text{th}\\ \text{term}}} = \underbrace{a}_{\substack{\text{first}\\ \text{term}}} + (\underbrace{n}_{\substack{\text{term}\\ \text{number}}} - 1)\underbrace{d}_{\substack{\text{common}\\ \text{difference}}}$$

PART 1: ARITHMETIC SEQUENCES

Find the first, sixth, and twelfth terms of each sequence.

a. $A(n) = -5 + (n - 1)(3)$ **b.** $A(n) = 6.3 + (n - 1)(5)$

PART 2: GEOMETRIC SEQUENCES

Find the common ratio of each sequence.

a. 750, 150, 30, 6, . . . **b.** −3, −6, −12, −24, . . .

PART 2: GEOMETRIC SEQUENCES

Rule	Geometric Sequence

$$\underbrace{A(n)}_{\substack{n\text{th}\\ \text{term}}} = \underbrace{a}_{\substack{\text{first}\\ \text{term}}} \cdot \underbrace{r^{n-1}}_{\substack{\text{common ratio}\\ \text{term number}}}$$

PART 2: GEOMETRIC SEQUENCES

Find the first, sixth, and twelfth terms of each sequence.

a. $A(n) = 4 \cdot 3^{n-1}$ **b.** $A(n) = -2 \cdot 5^{n-1}$

PART 3: ARITHMETIC VS. GEOMETRIC SEQUENCES

Determine whether each sequence is arithmetic or geometric.

a. $2, 4, 6, 8, \ldots$ **b.** $2, 4, 8, 16, \ldots$ **c.** $1, 3, 5, 7, \ldots$

CAN YOU?? PROVE IT!!

- I can think reasonably to discover and continue a number pattern
- I can form arithmetic sequences
- I can form geometric sequences
- I can use formulas for arithmetic and geometric sequences

Determine whether each sequence is *arithmetic* or *geometric*.

13. $2, 14, 98, 686, \ldots$ **14.** $12, 8, 4, 0, \ldots$ **15.** $9, -36, 144, -576, \ldots$