

## Sequences and Series (Sections 11.1 – 11.5 in Algebra 2)

By the end of this Unit you should be able to:

### General

- Find the terms of a sequence given an explicit or recursive formula
- Evaluate the sum of a series expressed in sigma notation

### Arithmetic

- Recognize arithmetic sequences
- Find the indicated term, common difference, 1st term, or term number of an arithmetic sequence
- Write and use explicit and recursive formulas for arithmetic sequences
- Find arithmetic means between two numbers
- Find the sum of the first  $n$  terms of an arithmetic series
- Use the formula to evaluate an arithmetic series

### Geometric

- Recognize geometric sequences

- *Introduction to Simplifying Exponents*

1. *Use properties of exponents to simplify expressions*

*\* make sure to include how to simplify: and*

2. *Evaluate and simplify expressions with negative exponents*

3. *Evaluate expressions with fractional exponents*

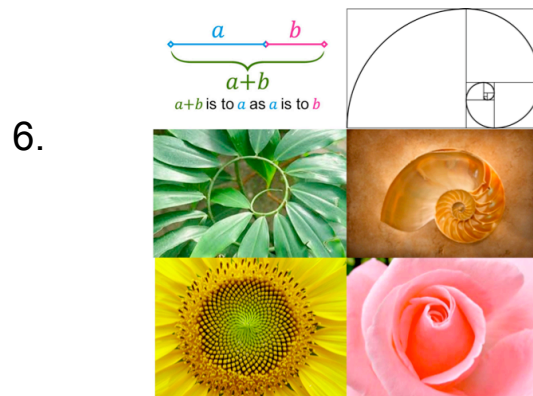
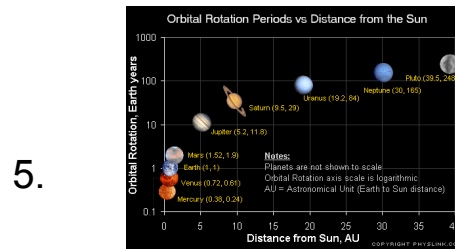
4. *Rewrite expressions with fractional exponents using radicals and vice versa*

- Find the indicated term, common ratio, and first term of a geometric sequence
- Find geometric means between two numbers
- Find the sum of the first  $n$  terms of a geometric series
- Use the formula for a geometric series

# Sequences and Series

- model real world \_\_\_\_\_
- any time you see a pattern in the real world, and are curious about a future \_\_\_\_\_ (sequences) or a future \_\_\_\_\_ (series), you are typically able to figure it out with a \_\_\_\_\_

Examples:



**Sequence -**

Ex. 1, 3, 5, 7, 9 ...

The three dots following a sequence is called an **ellipsis**. This indicates that the sequence is \_\_\_\_\_, meaning it continues without an \_\_\_\_\_.

If there is a final term in the sequence, it has an **end**, meaning the sequence is \_\_\_\_\_.

Terms (t) can be listed with subscripts. (Make note some texts use "a" or "u" to represent terms):

**Explicit Formula -**

ex.  $t_n = 2n$   
Find the 10th term:

**Recursive Formula-**

ex.  $t_n = t_{n-1} - 2$   
and  $t_1 = 1$   
Find the first 3 terms:

**A series** is an **expression** that indicates the \_\_\_\_\_ of a **sequence**.

Ex. Sequence: 2, 4, 6, 8, 10 (rule? \_\_\_\_\_)

Series: \_\_\_\_\_

**Summation notation** uses **sigma** \_\_\_\_\_ as a shortcut to expressing a series.

Ex.  $2 + 4 + 6 + 8 + 10$

Summation Notation:



(which is read as \_\_\_\_\_)

Ex. Write the terms of the series. Then evaluate:

$$\sum_{k=1}^4 5k$$

**HW: pg. 944 lesson 1.6 #1-30 odd**