

Algebra II Class Worksheet #2 Unit 9 page 1

There are two common types of sequences that we will be studying.

Arithmetic Sequences

Geometric Sequences

Arithmetic Sequences (sequences in which there is a common difference, d , between consecutive terms)

Examples:

- a. 3, 8, 13, 18, 23, ... ($d = 5$)
- b. 2, 5, 8, 11, 14, 17, 20, ... ($d = 3$)
- c. 18, 16, 14, 12, 10, 8, ... ($d = -2$)
- d. 5, 5.2, 5.4, 5.6, 5.8, 6, 6.2, ... ($d = 0.2$)

general arithmetic sequence: $a_1, a_1 + d, a_1 + 2d, a_1 + 3d, a_1 + 4d, \dots$

The Explicit Formula of an Arithmetic Sequence

$$a_n = a_1 + (n - 1)d$$

The Recursive Formula of an Arithmetic Sequence

$$a_{n+1} = a_n + d$$

Problems: Write the explicit and the recursive formulas for each of the following arithmetic sequences.

- 1. 3, 8, 13, 18, 23, ... _____
- 2. 2, 5, 8, 11, 14, 17, 20, ... _____
- 3. 18, 16, 14, 12, 10, 8, ... _____
- 4. 5, 5.2, 5.4, 5.6, 5.8, 6, 6.2, ... _____

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Geometric Sequences (sequences in which there is a common ratio, r , between consecutive terms)

Examples:

e. 3, 6, 12, 24, 48, ... ($r = 2$)

f. 2, -10, 50, -250, 1250, -6250, ... ($r = -5$)

g. 64, 32, 16, 8, 4, 2, 1, .5, .25, ... ($r = 0.5$)

h. 450, 45, 4.5, 0.45, 0.045, 0.0045, ... ($r = 0.1$)

general geometric sequence: $a_1, a_1r, a_1r^2, a_1r^3, a_1r^4, \dots$

The Explicit Formula of a Geometric Sequence

$$a_n = a_1 r^{n-1}$$

The Recursive Formula of a Geometric Sequence

$$a_{n+1} = r a_n$$

Problems: Write the explicit and the recursive formulas for each of the following geometric sequences.

5. 3, 6, 12, 24, 48, ... _____

6. 2, -10, 50, -250, 1250, -6250, ... _____

7. 64, 32, 16, 8, 4, 2, 1, .5, .25, ... _____

8. 450, 45, 4.5, 0.45, 0.045, 0.0045, ... _____