Day 2 – Recursive Formulas & More with Sequences

Information	Arithmetic	Geometric
Recursive Formula (allows you to find next term)	**a_1 = first number** **$a_n = a_{n-1} + d$** a_n: _____ a_{n-1}: _____ d: _____	**a_1 = first number** **$a_n = r(a_{n-1})$** a_n: _____ a_{n-1}: _____ r: _____

Generating a Sequence from a Recursive Formula

For each of the following recursive formulas, generate the first five terms.

a. $a_1 = 7$
$a_n = a_{n-1} + 4$

b. $a_1 = -54$
$a_n = \frac{1}{3}(a_{n-1})$

c. $a_1 = -3.5$
$a_n = a_{n-1} + 9$

d. $a_1 = 4$
$a_n = 2(a_{n-1})$

e. $a_1 = -7$
$a_n = a_{n-1} - 6$

f. $a_1 = 1025$
$a_n = \left(\frac{1}{5}\right)(a_{n-1})$

Creating Explicit and Recursive Formulas

For each of the following sequences, define the first term and common difference/constant ratio. Then create a simplified explicit formula and recursive formula.

a. 1, 8, 15 …	**b. 4, 0, -4 …**	**c. 400, 200, 100 …**
Type:	Type:	Type:
Explicit:	Explicit:	Explicit:
Recursive:	Recursive:	Recursive:
d. 3, 6, 12 …	**e. -5, 3, 11 …**	**f. 40, 10, $\frac{5}{2}$ …**
Type:	Type:	Type:
Explicit:	Explicit:	Explicit:
Recursive:	Recursive:	Recursive:

Challenge

a. Two terms of an arithmetic sequence are $a_5 = 15$ and $a_6 = 22$.

a. What is the common difference?

b. What are the first four terms of this sequence?

c. Write the **EXPLICIT** and **RECURSIVE** rules for this sequence.

b. Two terms of a geometric sequence are $a_5 = 162$ and $a_6 = 486$.

a. What is the constant ratio?

b. What are the first four terms of this sequence?

c. Write the **EXPLICIT** and **RECURSIVE** rules for this sequence.

c. Given $a_{10} = 16$ and $d = 5$, write the **EXPLICIT** and **RECURSIVE** rules for this sequence.