

Act. #54

Study Guide and Intervention

Recursion and Special Sequences

Special Sequences In a recursive formula, each succeeding term is formulated from one or more previous terms. A recursive formula for a sequence has two parts:

1. the value(s) of the first term(s), and
2. an equation that shows how to find each term from the term(s) before it.

Example

Find the first five terms of the sequence in which $a_1 = 6$, $a_2 = 10$, and $a_n = 2a_{n-2}$

$$a_1 = 6$$

$$a_2 = 10$$

$$a_3 = 2a_1 = 2(6) = 12$$

$$a_4 = 2a_2 = 2(10) = 20$$

$$a_5 = 2a_3 = 2(12) = 24$$

The first five terms of the sequence are 6, 10, 12, 20, 24.

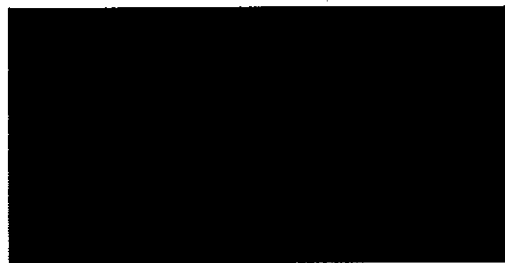
Exercises

Find the first five terms of each sequence.

1. $a_1 = 1, a_2 = 1, a_n = 2(a_{n-1} + a_{n-2})$

2. $a_1 = 1, a_n = \frac{1}{1 + a_{n-1}}$

3. $a_1 = 3, a_n = a_{n-1} + 2(n-2)$



7. $a_1 = 3, a_2 = 4, a_n = 2a_{n-2} + 3a_{n-1}$

8. $a_1 = 0.5, a_n = a_{n-1} + 2n$

9. $a_1 = 8, a_2 = 10, a_n = \frac{a_{n-2}}{a_{n-1}}$

10. $a_1 = 100, a_n = \frac{a_{n-1}}{n}$