Algebra 2

11-05 Using Recursive Rules with Sequences

Explicit Rule	
Gives the <i>n</i> th term	
• $a_n = 2 + 4n$	
Recursive Rule	
Each term is found by knowing the	
• $a_1 = 6; a_n = a_{n-1} + 4$	
Write the first 5 terms	
$a_1 = 3, a_n = 2a_{n-1} - 1$	$a_1 = 2; a_n = (a_{n-1})^2 + 1$
Special Recursive Rules	
Arithmetic Sequence	Geometric Sequence
$a_n = a_{n-1} + d, \ a_1 = a_1$	$a_n = r \cdot a_{n-1}, a_1 = a_1$
Write the rules for the arithmetic sequence where a_1	= 15 and <i>d</i> = 5.
Explicit	Recursive
	4
write the rule for the geometric sequence where $a_1 =$	4 and r = 0.2
explicit	Recursive
Write a recursive rule for	
1, 1, 4, 10, 28, 76,	44 11 $\frac{11}{11}$ $\frac{11}{11}$ $\frac{11}{11}$
	1, 1, 4, 16, 64,
	1, 11, 4, 16, 64,
	1, 11, 4, 16, 64, ····

Write a recursive rule for $a_n = 30 - 5n$ $a_n = 12(11)^{n-1}$

Write an explicit rule for each sequence. $a_1 = 7, a_n = a_{n-1} + 4$

 $a_1 = -2; a_n = 3a_{n-1}$

A controlled laboratory contains about 500 mosquitoes. Each day, 100 new mosquitoes hatch, but the population declines 85% due to a pesticide and natural causes.

a. Write a recursive rule for the number a_n of mosquitoes at the start of the n^{th} day.

b. Find the number of mosquitoes at the start of the fourth day.

c. Describe what happens to the population of mosquitoes over time.

You borrow \$2000 to travel. The loan has a 9% annual interest rate that is compounded monthly for 2 years. The monthly payment is \$91.37.

a. Find the balance after the fifth payment.

b. Find the amount of the last payment.