Name Key Date _____ Class _____

Sequences Review Homework

Find the indicated term of each sequence.

1. 12th term: 7, 14, 28, 56, …

$7 \cdot 2^{11} = 14{,}336$

2. 9th term: 2, 8.5, 15, 21.5, …

$2 + 6.5(8) = 54$

Find the explicit formula and recursive formula for each sequence:

3. 1, 2.5, 6.25, 15.625…

E: $a_n = 1 \cdot 2.5^{n-1}$

R: $a_1 = 1$
$a_n = a_{n-1} \cdot 2.5$

4. 25, 55, 85, 115…

E: $a_n = 25 + 30(n-1)$

R: $a_1 = 25$
$a_n = a_{n-1} + 30$

5. 20, 200, 2000, 20000…

E: $a_n = 20 \cdot 10^{n-1}$

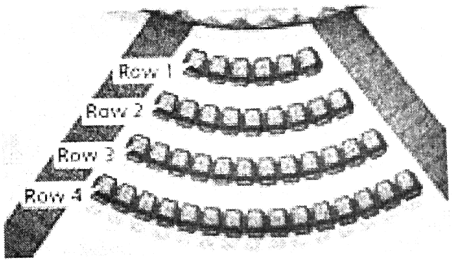
R: $a_1 = 20$
$a_n = a_{n-1} \cdot 10$

6. $\frac{3}{2}, \frac{6}{2}, \frac{9}{2}, \frac{12}{2}, \ldots$

E: $a_n = \frac{3}{2} + \frac{3}{2}(n-1)$

R: $a_1 = \frac{3}{2}$
$a_n = a_{n-1} + \frac{3}{2}$

7. Seats in a concert hall are arranged in the pattern shown. The number of seats in the rows form an arithmetic sequence.



a. Write a rule for the arithmetic sequence.

$a_n = 6 + 3(n-1)$

b. How many seats are in the 15th row?

$a_{15} = 48$

c. A ticket costs $40. Suppose every seat in the first 10 rows is filled. What is the total revenue from those seats? Show all of your work. Multiply how many seats are in the row by $40

Row #	1	2	3	4	5	6	7	8	9	10
Revenue	240	360	480	600	720	840	960	1080	1200	1320

Total $7800

8. The growth of Vanderbilt's squirrel population approximates a geometric sequence. After 4 years there are 2,880 squirrels and after 6 years there are 46,080 squirrels.

a. Write an explicit formula and a recursive formula to model this situation.

4	5	6
2880	11520	46,080
	×4	×4

E: $a_n = 45 \cdot 4^{n-1}$

R: $\begin{cases} a_1 = 45 \\ a_n = 4 \cdot a_{n-1} \end{cases}$

b. How many squirrels will there be in 11 years?

47,185,920

9. The recursive formula for a sequence is $a_1 = 25$; $a_n = 3 \cdot a_{n-1}$. What is the explicit formula?

$a_1 = 25$ → first term is 25

$a_n = 3 \cdot a_{n-1}$ → current term is 3 times the previous term

$a_n = 25 \cdot 3^{n-1}$

10. Stephen knows the fourth term in an arithmetic sequence is 55 and the ninth term in the sequence is 90. Explain how Stephen can find the common difference. Then find the first term of the sequence and write the explicit formula for the sequence.

$a_n = 34 + 7(n-1)$

$\frac{90-55}{5} = \frac{35}{5} = 7$ ↓ common difference

$90 - 7(8) = 34$ ↓ first term