F.BF.A.1: Sequences 2

1 Which function could be used to represent the sequence $8, 20, 50, 125, 312.5, \ldots$, given that $a_1 = 8$?

1) $a_n = a_{n-1} + a_1$
2) $a_n = 2.5\left(a_{n-1}\right)$
3) $a_n = a_1 + 1.5\left(a_{n-1}\right)$
4) $a_n = \left(a_1\right)\left(a_{n-1}\right)$

2 In 2014, the cost to mail a letter was 49¢ for up to one ounce. Every additional ounce cost 21¢. Which recursive function could be used to determine the cost of a 3-ounce letter, in cents?

1) $a_1 = 49;\ a_n = a_{n-1} + 21$
2) $a_1 = 0;\ a_n = 49a_{n-1} + 21$
3) $a_1 = 21;\ a_n = a_{n-1} + 49$
4) $a_1 = 0;\ a_n = 21a_{n-1} + 49$

3 The formula below can be used to model which scenario?

$$a_1 = 3000$$

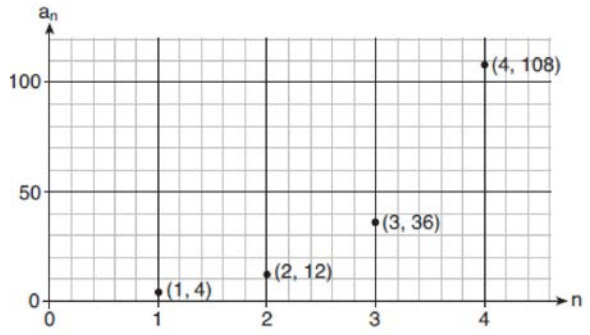
$$a_n = 0.80a_{n-1}$$

1) The first row of a stadium has 3000 seats, and each row thereafter has 80 more seats than the row in front of it.
2) The last row of a stadium has 3000 seats, and each row before it has 80 fewer seats than the row behind it.
3) A bank account starts with a deposit of $3000, and each year it grows by 80%.
4) The initial value of a specialty toy is $3000, and its value each of the following years is 20% less.

4 Write a recursive formula for the sequence $6, 9, 13.5, 20.25, \ldots$

5 Write a recursive formula for the sequence $189, 63, 21, 7, \ldots$.

6 Write a recursive formula, a_n, to describe the sequence graphed below.



7 While experimenting with her calculator, Candy creates the sequence 4, 9, 19, 39, 79, ... Write a recursive formula for Candy's sequence. Determine the eighth term in Candy's sequence.

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Answer Section

1 ANS: 2 REF: 011919ai

2 ANS: 1 REF: 011708ai

3 ANS: 4
The scenario represents a decreasing geometric sequence with a common ratio of 0.80.

REF: 061610aii

4 ANS:
$\frac{9}{6} = 1.5 \quad a_1 = 6$

$a_n = 1.5 \cdot a_{n-1}$

REF: 061931aii

5 ANS:
$\frac{63}{189} = \frac{1}{3} \quad a_1 = 189$

$a_n = \frac{1}{3} a_{n-1}$

REF: 062329aii

6 ANS:
$a_1 = 4$

$a_n = 3a_{n-1}$

REF: 081931aii

7 ANS:
$a_1 = 4 \qquad a_8 = 639$

$a_n = 2a_{n-1} + 1$

REF: 081729aii