Name ______________________ Date ______________ Class______________

LESSON 12-2

Geometric Sequences

Practice and Problem Solving: A/B

Each rule represents a geometric sequence. If the given rule is recursive, write it as an explicit rule. If the rule is explicit, write it as a recursive rule. Assume that *f*(1) is the first term of the sequence.

1. $f(n) = 11(2)^{n-1}$

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2. $f(1) = 2.5$; $f(n) = f(n-1) \cdot 3.5$ for $n \geq 2$

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3. $f(1) = 27$; $f(n) = f(n-1) \cdot \frac{1}{3}$ for $n \geq 2$

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4. $f(n) = -4(0.5)^{n-1}$

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Write an explicit rule for each geometric sequence based on the given terms from the sequence. Assume that the common ratio *r* is positive.

5. $a_1 = 90$ and $a_2 = 360$

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6. $a_1 = 16$ and $a_3 = 4$

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7. $a_1 = 2$ and $a_5 = 162$

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8. $a_2 = 30$ and $a_3 = 10$

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9. $a_4 = 135$ and $a_5 = 405$

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10. $a_3 = 400$ and $a_5 = 256$

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11. $a_2 = 80$ and $a_5 = 10$

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12. $a_4 = 22$ and $a_7 = 0.022$

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A bank account earns a constant rate of interest each month. The account was opened on March 1 with $18,000 in it. On April 1, the balance in the account was $18,045. Use this information for Problems 13–15.

13. Write an explicit rule and a recursive rule that can be used to find *A*(*n*), the balance after *n* months.

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14. Find the balance after 5 months.

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15. Find the balance after 5 years.

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Success for English Learners

1. A sequence is an arithmetic sequence if it has a common difference.
2. –7, –13, –19, –25, –31

LESSON 12-2

Practice and Problem Solving: A/B

1. $f(1) = 11;\ f(n) = f(n-1) \cdot 2$ for $n \geq 2$
2. $f(n) = 2.5(3.5)^{n-1}$
3. $f(n) = 27\left(\frac{1}{3}\right)^{n-1}$
4. $f(1) = -4;\ f(n) = f(n-1) \cdot 0.5$ for $n \geq 2$
5. $f(n) = 90(4)^{n-1}$
6. $f(n) = 16(0.5)^{n-1}$
7. $f(n) = 2(3)^{n-1}$
8. $f(n) = 90\left(\frac{1}{3}\right)^{n-1}$
9. $f(n) = 5(3)^{n-1}$
10. $f(n) = 625(0.8)^{n-1}$
11. $f(n) = 160(0.5)^{n-1}$
12. $f(n) = 22{,}000(0.1)^{n-1}$
13. $A(n) = 18{,}000(1.0025)^{n-1}$;
    $A(1) = 18{,}000$;
    $A(n) = A(n-1) \cdot 1.0025$ for $n \geq 2$
14. \$18,180.68
15. \$20,856.96

Practice and Problem Solving: C

1. $f(n) = \frac{2}{3}(8)^{n-1}$
2. $f(1) = -10$;
   $f(n) = f(n-1) \cdot 0.4$ for $n \geq 2$
3. $f(n) = 6(3)^{n-1}$
4. $f(n) = 18(0.5)^{n-1}$
5. $f(n) = 10{,}000(0.01)^{n-1}$
6. $f(n) = \frac{1}{3}\left(\frac{1}{4}\right)^{n-1}$
7. $f(n) = 200\left(\frac{2}{5}\right)^{n-1}$
8. $f(n) = -\frac{8}{3}\left(\frac{3}{2}\right)^{n-1}$
9. For $r > 0$, $f(n) = 2.5(4)^{n-1}$. For $r < 0$, $f(n) = 2.5(-4)^{n-1}$.
10. 88,573
11. 5%
12. Since there are 64 teams, the first round has 32 games. So, $T(n) = 32(0.5)^{n-1}$. The domain is $\{1, 2, 3, 4, 5, 6\}$.

Practice and Problem Solving: Modified

1. 270
2. 250
3. 32
4. 25
5. $f(n) = 7(3)^{n-1}$
6. $f(1) = 16;\ f(n) = f(n-1) \cdot 8$ for $n \geq 2$
7. $f(1) = 4.5;\ f(n) = f(n-1) \cdot 13$ for $n \geq 2$
8. $f(n) = 100(0.6)^{n-1}$
9. $f(n) = 9(2)^{n-1}$
10. $f(n) = 2(10)^{n-1}$
11. $f(n) = 5(4)^{n-1}$
12. $f(n) = 4(3)^{n-1}$
13. $p(n) = 20{,}000(1.04)^{n-1}$;
    $p(1) = 20{,}000$;
    $p(n) = p(n-1) \cdot 1.04$ for $n \geq 2$
14. $p(5) = 23{,}397;\ p(10) = 29{,}605$
15. The explicit rule is easier since you only have to evaluate one expression to find each prediction.

Reading Strategies

1. 2
2. 3
3. Possible answer: I divided each term by the previous term.
4. 486
5. 354,294
6. No; the ratios between terms are different.
7. 18,144