

LESSON
12-3**Geometric Series****Practice and Problem Solving: A/B**

Determine the values of a , n , and r for each geometric series. Then use the summation formula to find the sum.

1. $1 + 6 + 36 + 216 + 1296$

2. $2 - 12 + 72 - 432$

3. $-1 - 4 - 16 - 64 - 256$

4. $-4 + 8 - 16 + 32 - 64$

Determine the number of terms in each geometric series. Then evaluate the sum.

5. $3 + 15 + 75 + \dots + 46,875$

6. $2 - 6 + 18 - \dots + 1458$

7. $-1 - 5 - 25 - \dots - 78,125$

8. $-4 - 16 - 64 - \dots - 262,144$

Evaluate each geometric series described.

9. A geometric series begins with 4, ends with $\frac{1}{64}$, and has terms that decrease successively by half.

10. A geometric series has 9 terms, starts with -2 , and has a common ratio of -4 .

Solve.

11. Deanna received an e-mail asking her to forward it to 10 other people. Assume that no one breaks the chain and that there are no duplicate recipients. How many e-mails will have been sent after 8 generations, including Deanna's?

Success for English Learners

1. The sequence has a constant ratio between terms if it is geometric.
2. Write the second term over the first and simplify to find the common ratio.
3. You multiply the ratio by the last term given to find the next term. Then multiply that term by the ratio until you have the next three terms.
4. Multiply the common ratio by $f(n-1)$ where n is greater than or equal to the first term number plus 1 (usually $0 + 1$ or $1 + 1$). $f(n)$ with n being the first term number is equal to the first term of the sequence.

LESSON 12-3

Practice and Problem Solving: A/B

1. $a = 1, n = 5, r = 6; 1555$
2. $a = 2, n = 4, r = -6; -370$
3. $a = -1, n = 5, r = 4; -341$
4. $a = -4, n = 5, r = -2; -44$
5. $n = 7; 58,593$
6. $n = 7; 1094$
7. $n = 8; -97,656$
8. $n = 9; -349,524$
9. $\frac{511}{64}$
10. $-104,858$
11. $111,111,111$

Practice and Problem Solving: C

1. $a = 1.25, n = 5, r = 4; 426.25$
2. $a = -2, n = 5, r = -5; -1042$
3. $a = 2, n = 4, r = \frac{1}{2}; \frac{15}{4}$
4. $a = -20, n = 5, r = \frac{1}{2}; -\frac{155}{4}$
5. -317.5
6. -42.75
7. $\frac{209,715}{262,144}$
8. $\frac{1023}{256}$

9. $\frac{384,064}{78,125}$

10. $\frac{3577}{1280}$

11. a. \$11,113.20
b. \$41,377.20

Practice and Problem Solving: Modified

1. $a = 1, n = 4, r = 3; 40$
2. $a = 2, n = 5, r = 2; 62$
3. $a = 3, n = 4, r = -4; -153$
4. $a = -2, n = 5, r = 4; -682$
5. $n = 9; 511$
6. $n = 7; 86$
7. $n = 10; -88,572$
8. $n = 10; 1364$
9. 1093
10. 255
11. $\$110,512.63$

Reading Strategies

1. -254
2. $19,682$
3. 9831
4. -341

Success for English Learners

1. The common ratio is negative because it is found by dividing any term by the previous term, and a negative divided by a positive is negative.
2. If the common ratio were positive, the signs would all be the same: either all positive or all negative. This is because a positive divided by a positive is positive, and a negative divided by a negative is also positive.
3. 682

MODULE 12 Challenge

1. $160, 80, 40$
2. $7, 10, 13$