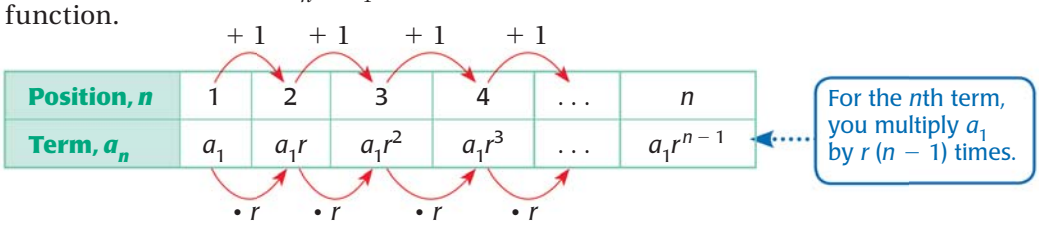
FUNCTIONS The table shows that a rule for finding the nth term of a geometric sequence is $a_n = a_1 r^{n-1}$. Notice that the rule is an exponential function.



KEY CONCEPT *For Your Notebook*

General Rule for a Geometric Sequence

The nth term of a geometric sequence with first term a_1 and common ratio r is given by: $a_n = a_1 r^{n-1}$.

EXAMPLE 3 Write a rule for a geometric sequence

Write a rule for the nth term of the geometric sequence in Example 1. Then find a_{10}.

Solution

To write a rule for the nth term of the sequence, substitute the values for a_1 and r in the general rule $a_n = a_1 r^{n-1}$. Because $a_1 = 128$ and $r = \frac{1}{2}$, $a_n = 128 \cdot \left(\frac{1}{2}\right)^{n-1}$. The 10th term of the sequence is $a_{10} = 128 \cdot \left(\frac{1}{2}\right)^{10-1} = \frac{1}{4}$.

PRACTICE

EXAMPLES 1, 2, and 3 on pp. 539–540 for Exs. 1–10

Tell whether the sequence is *arithmetic* or *geometric*. Then graph the sequence.

1. 3, 12, 48, 192, . . .

2. 7, 16, 25, 34, . . .

3. 34, 28, 22, 16, . . .

4. 1024, 128, 16, 2, . . .

5. 9, −18, 36, −72, . . .

6. 29, 43, 57, 71, . . .

Write a rule for the nth term of the geometric sequence. Then find a_7.

7. 1, −5, 25, −125, . . .

8. 13, 26, 52, 104, . . .

9. 432, 72, 12, 2, . . .

10. E-MAIL A chain e-mail instructs the recipient to forward the e-mail to four more people. The table shows the number of rounds of sending the e-mail and the number of new e-mails generated. Write a rule for the nth term of the sequence. Then graph the first six terms of the sequence.

Number of rounds sending e-mail, n	1	2	3	4
Number of new e-mails generated, a_n	1	4	16	64