

Example B

Generate a sequence using this pattern: Starting with 3, each term is 2 times the previous term.

The sequence generated by this pattern description is 3, 6, 12, 24, . . .

Investigation 1.2.2



Work with a partner again. This time write a description of a pattern that will generate a sequence. Exchange your descriptions and write out the first few terms of a sequence. Check that the sequence you wrote is that which your partner intended.

Exercise Set 1.2

Use inductive reasoning to find the next two terms of each sequence. For Exercises 1 and 2, write a sentence describing how you found those terms.

- 1, 10, 100, 1000, -?-, -?-
 - 180, 360, 540, 720, -?-, -?-
 - 0, 10, 21, 33, 46, 60, -?-, -?-
 - 1, 3, 6, 10, 15, 21, -?-, -?-
 - * 1, 4, 9, 16, 25, 36, -?-, -?-
 - W, T, Q, N, K, H, -?-, -?-
 - * $\frac{1}{6}$, $\frac{1}{3}$, $\frac{1}{2}$, $\frac{2}{3}$, -?-, -?-
 - * a, 6, c, 12, e, 18, -?-, -?-
 - $\frac{1}{2}$, 9, $\frac{2}{3}$, 10, $\frac{3}{4}$, 11, -?-, -?-
 - A, B, D, G, K, -?-, -?-
 - * 1, 1, 2, 3, 5, 8, 13, -?-, -?-
 - 1, 3, 4, 7, 11, 18, -?-, -?-
 - 1, 2, 4, 8, 16, 32, -?-, -?-
 - * 1, 3, 7, 15, 31, 63, -?-, -?-
 - * 2, 6, 15, 31, 56, 92, -?-, -?-
 - * 3, 5, 11, 29, 83, 245, -?-, -?-
 - 0, 3, 8, 15, 24, 35, -?-, -?-
 - 3, -12, 48, -192, 768, -?-, -?-
 - * 1, 2, 5, 14, 41, 122, -?-, -?-
 - $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$, $\frac{1}{16}$, -?-, -?-
21. Now it's your turn. Generate the first five terms of a sequence. Give the sequence to a member of your family or to a friend and ask him or her to find the next two terms in the sequence. Can he or she find your pattern?

22. Write the first five terms of two different sequences in which 12 is the third term.

For Exercises 23-26, study the given information until you discover a relationship that holds true for all the data. Then state your finding by completing the conjecture. Finally, try some numbers of your own to test your conjecture.

23.* $3 + 5 = 8$ $13 + 27 = 40$
 $-3 + 5 = 2$ $51 + 85 = 136$
 $-1 + 1 = 0$ $-141 + -85 = -226$

Conjecture: The sum of two odd numbers is always an -?-.

25. $24 + 46 = 70$ $0 + 26 = 26$
 $-12 + 8 = -4$ $-26 + -18 = -44$
 $-18 + 28 = 10$ $22 + 58 = 80$

Conjecture: The sum of -?-.

24. $24 + 57 = 81$ $147 + 534 = 681$
 $2 + -7 = -5$ $-4 + -9 = -13$
 $0 + 9 = 9$ $80 + -91 = -11$

Conjecture: The sum of an odd and an even number is always -?-.

26. $3 \cdot 4 = 12$ $-24 \cdot -3 = 72$
 $12 \cdot 5 = 60$ $-7 \cdot 8 = -56$
 $11 \cdot -4 = -44$ $-71 \cdot 0 = 0$

Conjecture: The product of -?-.