

Example 4

$$\{9, 11, 13, 15, \dots\}$$

Describe the sequence. Find the first term and the common difference.

infinite sequence $a_1 = 9$ $d = 2$

Example 5

Create a finite sequence of five terms with $a_1 = 10$ and $d = -1.4$.

$$\{10, 10 - 1.4, 10 - 2(1.4), 10 - 3(1.4), 10 - 4(1.4)\}$$

or $\{10, 8.6, 7.2, 5.8, 4.4\}$

Practice Problems 1

Write the first four terms, given a_1 and d .

1. $a_1 = 3, d = 5$

2. $a_1 = 250, d = -25$

3. $a_1 = 81, d = 19.6$

4. $a_1 = -2, d = 1 \frac{2}{3}$

Notice the way we write the pattern to solve for each term. We begin with the first term, and then add the difference times the number of the next term in the sequence. In practice problem #1, the first term in the sequence is 3, the second term is 3 plus the difference 5, and the third term is 8 plus 5, which is the same as $3 + 5(2)$.

Example 6

Write the first four terms of $\{a_n\} = \{2n - 7\}$. Start with $n = 1$.

$$\{a_n\} = \{a_1, a_2, a_3, a_4\}$$

$$\{a_n\} = \{2(1) - 7, 2(2) - 7, 2(3) - 7, 2(4) - 7\}$$

$$\{a_n\} = \{-5, -3, -1, 1\}$$

$$a_1 = -5, d = 2$$

Example 7

Write the first four terms of $\{a_n\} = \{5 - 3n\}$.

$$\{a_n\} = \{a_1, a_2, a_3, a_4\}$$

$$\{a_n\} = \{5 - 3(1), 5 - 3(2), 5 - 3(3), 5 - 3(4)\}$$

$$\{a_n\} = \{2, -1, -4, -7\}$$

$$a_1 = 2, d = -3$$

Practice Problems 2

Write the first four terms of each sequence.

1. $\{a_n\} = \{n + 50\}$

2. $\{a_n\} = \{-n - 6\}$

3. $\{a_n\} = \{4n + 1\}$

4. $\{a_n\} = \{-5n + 20\}$

Example 9

Find the eighth term of S_8 , with $a_1 = 2$ and $d = -3$.

$$S_8 = a_1 + (n - 1)d = (2) + (8 - 1)(-3) = 2 - 21 = -19$$

Find it the long way to confirm: $\{2, -1, -4, -7, -10, -13, -16, \underline{-19}\}$

Example 10

Find the 15th term with $a_1 = 4.3$, and $a_2 = 5.1$.

If $a_1 = 4.3$ and $a_2 = 5.1$, then $d = a_2 - a_1 = 5.1 - 4.3 = .8$

$$S_{15} = a_1 + (n - 1)d = (4.3) + (15 - 1)(.8) = 4.3 + 11.2 = 15.5$$

Practice Problems 3

1. Find the 8th term with $a_1 = 9.6$, and $d = 12.1$.
2. Find the 10th term with $a_1 = \sqrt{2}$, and $a_2 = 4\sqrt{2}$.
3. Find the 12th term with $a_1 = -\frac{1}{2}$, and $a_2 = 1\frac{1}{4}$.
4. Find the 20th term with $a_1 = 25$, and $a_2 = 10$.

Practice Problems 4

You may use either A or B to solve these problems. The solutions below are done with formula B and some of the solutions for the student text are done with formula A, but either is acceptable.

$$1. \sum_{k=1}^{10} \left\{ \frac{1}{2}k \right\}$$

$$2. \sum_{k=1}^8 \left\{ \frac{k}{5} + 3 \right\}$$

$$3. \sum_{M=1}^{10} \left\{ -\frac{2}{3}M + 4 \right\}$$

$$4. \sum_{R=0}^{20} \{5R - 20\}$$