### Exercises 1-3  Recursive Sequences

Find the first four terms of the sequence defined recursively:

1. \( a_1 = 5 \) and \( a_n = 3 - a_{n-1} \) for \( n \geq 2 \)

2. \( b_1 = -1 \) and \( b_n = -2 \cdot b_{n-1} \) for \( n \geq 2 \)

3. \( a_1 = 2, a_2 = 3 \) and \( a_n = a_{n-1} + a_{n-2} \) for \( n \geq 3 \)

### Exercises 4-5  Expanded Form

Write out the terms for the given summation and then evaluate the sum.

4. \[ \sum_{j=1}^{5} \frac{1}{j + 1} \]
Exercises 6  nth Term Formula  The first few terms of a sequence are given. Determine a formula for the nth term. The answers are not unique, since many sequences could have the same starting terms. See Example 2.

6. \( \frac{1}{2}, -\frac{3}{5}, \frac{3}{4}, -\frac{4}{5}, \ldots \)

Exercises 7-8  Sigma Notation  Express the sum in sigma notation.

7. \( 1 + 4 + 9 + 16 + 25 + 36 + 49 + 64 \)

8. \( \frac{1}{2} - \frac{1}{4} + \frac{1}{6} - \frac{1}{8} + \frac{1}{10} - \frac{1}{12} \)