

EXERCISE 8.1

Write the first five terms of each of the sequences in Exercises 1 to 6 whose n^{th} terms are:

1. $a_n = n(n + 2)$ 2. $a_n = \frac{n}{n+1}$ 3. $a_n = 2^n$
4. $a_n = \frac{2n-3}{6}$ 5. $a_n = (-1)^{n-1} 5^{n+1}$ 6. $a_n = n \frac{n^2 + 5}{4}$

Find the indicated terms in each of the sequences in Exercises 7 to 10 whose n^{th} terms are:

7. $a_n = 4n - 3$; a_{17}, a_{24} 8. $a_n = \frac{n^2}{2^n}$; a_7
9. $a_n = (-1)^{n-1} n^3$; a_9 10. $a_n = \frac{n(n-2)}{n+3}$; a_{20}

Write the first five terms of each of the sequences in Exercises 11 to 13 and obtain the corresponding series:

11. $a_1 = 3, a_n = 3a_{n-1} + 2$ for all $n > 1$

12. $a_1 = -1, a_n = \frac{a_{n-1}}{n}, n \geq 2$

13. $a_1 = a_2 = 2, a_n = a_{n-1} - 1, n > 2$

14. The Fibonacci sequence is defined by

$$1 = a_1 = a_2 \text{ and } a_n = a_{n-1} + a_{n-2}, n > 2.$$

Find $\frac{a_{n+1}}{a_n}$, for $n = 1, 2, 3, 4, 5$