Exercises and Problems for Section 9.1

Exercises

For Exercises 1–6, find the first five terms of the sequence from the formula for s_n, $n \geq 1$.

1. $2^n + 1$
2. $n + (-1)^n$
3. $\dfrac{2n}{2n+1}$
4. $(-1)^n \left(\dfrac{1}{2}\right)^n$
5. $(-1)^{n+1} \left(\dfrac{1}{2}\right)^{n-1}$
6. $\left(1 - \dfrac{1}{n+1}\right)^{n+1}$

In Exercises 7–12, find a formula for s_n, $n \geq 1$.

7. 4, 8, 16, 32, 64, ...
8. 1, 3, 7, 15, 31, ...
9. 2, 5, 10, 17, 26, ...
10. 1, −3, 5, −7, 9, ...
11. 1/3, 2/5, 3/7, 4/9, 5/11, ...
12. 1/2, −1/4, 1/6, −1/8, 1/10, ...

In Exercises 13–16, find the first six terms of the recursively defined sequence.

13. $s_n = s_{n-1} + n$ for $n > 1$ and $s_1 = 1$
14. $s_n = 2s_{n-1} + 3$ for $n > 1$ and $s_1 = 1$
15. $s_n = s_{n-1} + \left(\frac{1}{2}\right)^{n-1}$ for $n > 1$ and $s_1 = 0$
16. $s_n = s_{n-1} + 2s_{n-2}$ for $n > 2$ and $s_1 = 1$, $s_2 = 5$

[2] See the online supplement for a proof