LISTA 17 – **SEQUÊNCIAS**

James Stewart, Cálculo , v. 2

3–12 Liste os cinco primeiros termos da sequência.

3. $a_n = \dfrac{2n}{n^2 + 1}$

4. $a_n = \dfrac{3^n}{1 + 2^n}$

5. $a_n = \dfrac{(-1)^{n-1}}{5^n}$

6. $a_n = \cos \dfrac{n\pi}{2}$

7. $a_n = \dfrac{3(-1)^n}{n!}$

8. $\{2 \cdot 4 \cdot 6 \cdot \cdots \cdot (2n)\}$

9. $a_1 = 1, \quad a_{n+1} = 5a_n - 3$

10. $a_1 = 6, \quad a_{n+1} = \dfrac{a_n}{n}$

11. $a_1 = 2, \quad a_{n+1} = \dfrac{a_n}{1 + a_n}$

12. $a_1 = 2, \quad a_2 = 1, \quad a_{n+1} = a_n - a_{n-1}$

13–18 Encontre uma fórmula para o termo geral a_n da sequência, assumindo que o padrão dos primeiros termos continue.

13. $\left\{1, \frac{1}{3}, \frac{1}{5}, \frac{1}{7}, \frac{1}{9}, \ldots\right\}$

14. $\left\{1, -\frac{1}{3}, \frac{1}{9}, -\frac{1}{27}, \frac{1}{81}, \ldots\right\}$

15. $\left\{-3, 2, -\frac{4}{3}, \frac{8}{9}, -\frac{16}{27}, \ldots\right\}$

16. $\{5, 8, 11, 14, 17, \ldots\}$

17. $\left\{\frac{1}{2}, -\frac{4}{3}, \frac{9}{4}, -\frac{16}{5}, \frac{25}{6}, \ldots\right\}$

18. $\{1, 0, -1, 0, 1, 0, -1, 0, \ldots\}$

23–56 Determine se a sequência converge ou diverge. Se ela convergir, encontre o limite.

23. $a_n = 1 - (0{,}2)^n$

24. $a_n = \dfrac{n^3}{n^3 + 1}$

25. $a_n = \dfrac{3 + 5n^2}{n + n^2}$

26. $a_n = \dfrac{n^3}{n + 1}$

27. $a_n = e^{1/n}$

28. $a_n = \dfrac{3^{n+2}}{5^n}$

29. $a_n = \operatorname{tg}\left(\dfrac{2n\pi}{1 + 8n}\right)$

30. $a_n = \sqrt{\dfrac{n + 1}{9n + 1}}$

31. $a_n = \dfrac{n^2}{\sqrt{n^3 + 4n}}$

32. $a_n = e^{2n/(n+2)}$

33. $a_n = \dfrac{(-1)^{n-1} n}{n^2 + 1}$

34. $a_n = \dfrac{(-1)^n n^3}{n^3 + 2n^2 + 1}$

35. $a_n = \cos(n/2)$

36. $a_n = \cos(2/n)$

37. $\left\{\dfrac{(2n - 1)!}{(2n + 1)!}\right\}$

38. $\left\{\dfrac{\ln n}{\ln 2n}\right\}$

39. $\left\{\dfrac{e^n + e^{-n}}{e^{2n} - 1}\right\}$

40. $a_n = \dfrac{\operatorname{tg}^{-1} n}{n}$

41. $\{n^2 e^{-n}\}$

42. $a_n = \ln(n + 1) - \ln n$

43. $a_n = \dfrac{\cos^2 n}{2^n}$

44. $a_n = \sqrt[n]{2^{1+3n}}$