LISTA 19 – **SÉRIES INFINITAS E TESTE DA INTEGRAL**

James Stewart, Cálculo , v. 2

3–32 Determine se a série converge ou diverge.

3. $\sum_{n=1}^{\infty} \frac{n}{2n^3 + 1}$

4. $\sum_{n=2}^{\infty} \frac{n^3}{n^4 - 1}$

5. $\sum_{n=1}^{\infty} \frac{n + 1}{n\sqrt{n}}$

6. $\sum_{n=1}^{\infty} \frac{n - 1}{n^2\sqrt{n}}$

7. $\sum_{n=1}^{\infty} \frac{9^n}{3 + 10^n}$

8. $\sum_{n=1}^{\infty} \frac{4 + 3^n}{2^n}$

9. $\sum_{k=1}^{\infty} \frac{\ln k}{k}$

10. $\sum_{n=0}^{\infty} \frac{1 + \operatorname{sen} n}{10^n}$

11. $\sum_{k=1}^{\infty} \frac{\sqrt[3]{k}}{\sqrt{k^3 + 4k + 3}}$

12. $\sum_{k=1}^{\infty} \frac{(2k - 1)(k^2 - 1)}{(k + 1)(k^2 + 4)^2}$

13. $\sum_{n=1}^{\infty} \frac{\operatorname{arctg} n}{n^{1,2}}$

14. $\sum_{n=2}^{\infty} \frac{\sqrt{n}}{n - 1}$

15. $\sum_{n=1}^{\infty} \frac{4^{n+1}}{3^n - 2}$

16. $\sum_{n=1}^{\infty} \frac{1}{\sqrt[3]{3n^4 + 1}}$

17. $\sum_{n=1}^{\infty} \frac{1}{\sqrt{n^2 + 1}}$

18. $\sum_{n=1}^{\infty} \frac{1}{2n + 3}$

19. $\sum_{n=1}^{\infty} \frac{1 + 4^n}{1 + 3^n}$

20. $\sum_{n=1}^{\infty} \frac{n + 4^n}{n + 6^n}$

21. $\sum_{n=1}^{\infty} \frac{\sqrt{n + 2}}{2n^2 + n + 1}$

22. $\sum_{n=3}^{\infty} \frac{n + 2}{(n + 1)^3}$

23. $\sum_{n=1}^{\infty} \frac{5 + 2n}{(1 + n^2)^2}$

24. $\sum_{n=1}^{\infty} \frac{n^2 - 5n}{n^3 + n + 1}$

25. $\sum_{n=1}^{\infty} \frac{\sqrt{n^4 + 1}}{n^3 + n^2}$

26. $\sum_{n=2}^{\infty} \frac{1}{n\sqrt{n^2 - 1}}$

27. $\sum_{n=1}^{\infty} \left(1 + \frac{1}{n}\right)^2 e^{-n}$

28. $\sum_{n=1}^{\infty} \frac{e^{1/n}}{n}$

29. $\sum_{n=1}^{\infty} \frac{1}{n!}$

30. $\sum_{n=1}^{\infty} \frac{n!}{n^n}$

De 2 a 26 – Determine se a série é absolutamente convergente, condicionalmente convergente ou divergente.

2. $\sum_{n=1}^{\infty} \frac{(-2)^n}{n^2}$

3. $\sum_{n=1}^{\infty} \frac{n}{5^n}$

4. $\sum_{n=1}^{\infty} (-1)^{n-1} \frac{n}{n^2+4}$

5. $\sum_{n=1}^{\infty} \frac{(-1)^{n+1}}{\sqrt[4]{n}}$

6. $\sum_{n=0}^{\infty} \frac{(-3)^n}{(2n+1)!}$

7. $\sum_{k=1}^{\infty} k\left(\frac{2}{3}\right)^k$

8. $\sum_{n=1}^{\infty} \frac{n!}{100^n}$

9. $\sum_{n=1}^{\infty} (-1)^n \frac{(1,1)^n}{n^4}$

10. $\sum_{n=1}^{\infty} (-1)^n \frac{n}{\sqrt{n^3+2}}$

11. $\sum_{n=1}^{\infty} \frac{(-1)^n e^{1/n}}{n^3}$

12. $\sum_{n=1}^{\infty} \frac{\operatorname{sen} 4n}{4^n}$

13. $\sum_{n=1}^{\infty} \frac{10^n}{(n+1)4^{2n+1}}$

14. $\sum_{n=1}^{\infty} (-1)^{n+1} \frac{n^2 2^n}{n!}$

15. $\sum_{n=1}^{\infty} \frac{(-1)^n \operatorname{arctg} n}{n^2}$

16. $\sum_{n=1}^{\infty} \frac{3-\cos n}{n^{2/3}-2}$

17. $\sum_{n=2}^{\infty} \frac{(-1)^n}{\ln n}$

18. $\sum_{n=1}^{\infty} \frac{n!}{n^n}$

19. $\sum_{n=1}^{\infty} \frac{\cos(n\pi/3)}{n!}$

20. $\sum_{n=1}^{\infty} \frac{(-2)^n}{n^n}$

21. $\sum_{n=1}^{\infty} \left(\frac{n^2+1}{2n^2+1}\right)^n$

22. $\sum_{n=2}^{\infty} \left(\frac{-2n}{n+1}\right)^{5n}$

23. $\sum_{n=1}^{\infty} \left(1+\frac{1}{n}\right)^{n^2}$

24. $\sum_{n=1}^{\infty} \frac{(2n)!}{(n!)^2}$

25. $\sum_{n=1}^{\infty} \frac{n^{100}100^n}{n!}$

26. $\sum_{n=1}^{\infty} \frac{2^{n^2}}{n!}$

35. Para quais das seguintes séries o Teste da Razão não é conclusivo (isto é, ele não dá uma resposta definida)?

(a) $\sum_{n=1}^{\infty} \frac{1}{n^3}$

(b) $\sum_{n=1}^{\infty} \frac{n}{2^n}$

(c) $\sum_{n=1}^{\infty} \frac{(-3)^{n-1}}{\sqrt{n}}$

(d) $\sum_{n=1}^{\infty} \frac{\sqrt{n}}{1+n^2}$