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Cálculo Diferencial e Integral 3
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Lista 2 - Séries

Nos problemas de 1 a 29, determine se a série infinita dada converge ou diverge. Se converge, determine sua soma

1. $1+\frac{1}{3}+\frac{1}{9}+\ldots+\frac{1}{3^n}+\ldots$
2. $1+e^{-1}+e^{-2}+\ldots+e^{-n}+\ldots$
3. $1+3+5+7+\ldots+(2n-1)+\ldots$
4. $\frac{1}{2}+\frac{1}{\sqrt{2}}+\frac{1}{\sqrt[3]{2}}+\ldots+\frac{1}{\sqrt[n]{2}}+\ldots$
5. $1-2+4-8+\ldots+(-2)^n+\ldots$
6. $1-\frac{1}{4}+\frac{1}{16}-\ldots+(-\frac{1}{4})^n+\ldots$
7. $4+\frac{4}{3}+\frac{4}{9}+\frac{4}{27}+\ldots+\frac{4}{3^n}+\ldots$
8. $\frac{1}{3}+\frac{2}{9}+\frac{4}{27}+\ldots+\frac{2^{n-1}}{3^n}+\ldots$
9. $1+(1.01)+(1.01)^2+(1.01)^3+\ldots+(1.01)^n+\ldots$
10. $1+\frac{1}{\sqrt{2}}+\frac{1}{\sqrt[3]{3}}+\ldots+\frac{1}{\sqrt[n]{n}}+\ldots$
11. $\sum_{n=0}^{\infty}\frac{(-1)^n n}{n+1}$.
12. $\sum_{n=1}^{\infty}(\frac{e}{10})^n$
13. $\sum_{n=0}^{\infty}(-1)^n(\frac{3}{e})^n$
14. $\sum_{n=0}^{\infty}\frac{3^n-2^n}{4^n}$
15. $\sum_{n=1}^{\infty}(\sqrt{2})^{1-n}$
16. $\sum_{n=1}^{\infty}(\frac{1}{2}-\frac{1}{2^n})$
17. $\sum_{n=1}^{\infty}\frac{n}{10n+17}$
18. $\sum_{n=1}^{\infty}\frac{\sqrt{n}}{\ln(n+1)}$
19. $\sum_{n=1}^{\infty}(5^{-n}-7^{-n})$
20. $\sum_{n=1}^{\infty}(\frac{e}{\pi})^n$
21. $\sum_{n=1}^{\infty}(\frac{\pi}{e})^n$
22. $\sum_{n=0}^{\infty}(\frac{100}{99})^n$
23. $\sum_{n=0}^{\infty}(\frac{99}{100})^n$
24. $\sum_{n=0}^{\infty}\frac{1+2^n+3^n}{5^n}$
25. $\sum_{n=0}^{\infty}\frac{1+2^n+5^n}{3^n}$
26. $\sum_{n=0}^{\infty}\frac{7\times 5^n+3\times 11^n}{13^n}$
27. $\sum_{n=1}^{\infty}\sqrt[n]{2}$
28. $\sum_{n=1}^{\infty}\left[(\frac{7}{11})^n-(\frac{3}{5})^n\right]$
29. $\sum_{n=0}^{\infty}\frac{1}{1+(\frac{1}{10})^n}$

25. Mostre que: se $\sum a_n$ diverge e c é uma constante distinto de zero, então $\sum ca_n$ diverge.

26. Suponha que $\sum a_n$ converge e que $\sum b_n$. Mostre que $\sum(a_n+b_n)$ diverge.

27. Sejam S_n e T_n a n-ésima soma parcial de $\sum a_n$ e $\sum b_n$ respectivamente. Suponha que $a_n=b_n$ para todo $n>k$. Mostre que $S_n-T_n=S_k-T_k$ se $n>k$.