

**EXERCÍCIO 1** – Analise as séries abaixo quanto a convergência ou divergência delas:

a)  $\sum_{n=1}^{+\infty} \frac{1 \cdot 4 \cdot 7 \cdots (3n+1)}{n^5}$

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

c)  $\sum_{n=0}^{+\infty} \frac{1}{n^2+1}$

d)  $\sum_{n=1}^{+\infty} \frac{n^n}{n!}$

e)  $\sum_{n=0}^{+\infty} \frac{n!+n^2}{(n+1)!}$

f)  $\sum_{n=0}^{+\infty} \frac{3^n}{1+4^n}$

g)  $\sum_{n=1}^{+\infty} \frac{1}{n} \sin\left(\frac{1}{n}\right)$

h)  $\sum_{n=1}^{+\infty} \frac{n!2^n}{n^n}$

i)  $\sum_{n=0}^{+\infty} \frac{n}{n^2+2n+1}$

j)  $\sum_{n=1}^{+\infty} \frac{n^3+4}{2^n}$

k)  $\sum_{n=1}^{+\infty} \frac{n^5-3n^4+2}{2n^8+n-1}$

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

m)  $\sum_{n=1}^{+\infty} \frac{1 \cdot 3 \cdot 5 \cdots (2n-1)}{2 \cdot 4 \cdot 6 \cdots 2n}$

n)  $\sum_{n=1}^{+\infty} \frac{5 \cdot 7 \cdot 9 \cdots (2n+3)}{2 \cdot 4 \cdot 6 \cdots 2n} \frac{1}{n^\alpha}$

o)  $\sum_{n=3}^{+\infty} (-1)^n \frac{1}{\ln(n)}$

p)  $\sum_{n=1}^{+\infty} 2^{-n} \sin(n)$

**EXERCÍCIO 2** – Determine  $x$  para que as séries abaixo sejam convergentes:

a)  $\sum_{n=1}^{+\infty} \frac{x^n}{n}$

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

c)  $\sum_{n=1}^{+\infty} \frac{x^n}{n!}$

**EXERCÍCIO 3** – Determine o domínio das seguintes funções abaixo usando o raio de convergência:

a)  $f(x) = \sum_{n=0}^{+\infty} n^n x^n$

b)  $f(x) = \sum_{n=0}^{+\infty} \frac{x^n}{n+2}$

c)  $f(x) = \sum_{n=0}^{+\infty} \frac{x^n}{n^3}$

d)  $f(x) = \sum_{n=0}^{+\infty} \frac{x^n}{n!}$

e)  $f(x) = \sum_{n=0}^{+\infty} \frac{x^n}{n^2+3}$