

Lista 7

☆ Séries de números reais

1. Verifique se cada uma das séries abaixo é convergente ou divergente, justificando sua resposta:

$$(1) \sum_{n=3}^{\infty} \frac{1}{\sqrt{n^2 - 4}}$$

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

$$(3) \sum_{n=1}^{\infty} \frac{\sqrt[n]{n}}{n^2}$$

$$(4) \sum_{n=1}^{\infty} \frac{2^n}{(n!)^\lambda}, \lambda > 0$$

$$(5) \sum_{n=1}^{\infty} \frac{(2n)!}{n!^2}$$

$$(6) \sum_{n=2}^{\infty} \frac{\ln n}{n}$$

$$(7) \sum_{n=2}^{\infty} \frac{1}{n^{\ln n}}$$

$$(8) \sum_{n=2}^{\infty} \frac{1}{(\ln n)^n}$$

$$(9) \sum_{n=2}^{\infty} \frac{\ln n}{n^2}$$

$$(10) \sum_{n=2}^{\infty} \frac{\ln n}{n^p}, p > 0$$

$$(11) \sum_{n=1}^{\infty} \frac{n!3^n}{n^n}$$

$$(12) \sum_{n=1}^{\infty} 3^n \left(\frac{n}{n+1}\right)^{n^2}$$

$$(13) \sum_{n=1}^{\infty} \frac{1}{n + \sqrt[17]{n}}$$

$$(14) \sum_{n=0}^{\infty} \left(\frac{2n+1}{3n+4}\right)^n$$

$$(15) \sum_{n=1}^{\infty} \frac{(2n)^n}{n^{2n}}$$

$$(16) \sum_{n=1}^{\infty} \frac{n^3}{(\ln 2)^n}$$

$$(17) \sum_{n=1}^{\infty} \frac{1}{(\arctan n)^n}$$

$$(18) \sum_{n=0}^{\infty} \frac{n+2}{(n+1)^3}$$

$$(19) \sum_{n=0}^{\infty} \frac{1+2^n}{1+3^n}$$

$$(20) \sum_{n=0}^{\infty} \frac{3^n}{4^n + 5^n}$$