

1. Convergent or not?

$$(a) \sum_{n=0}^{\infty} \frac{n^3 2^n}{3^n}$$

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

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

$$(d) \sum_{n=1}^{\infty} n^5 (1.1)^{-n}$$

2. For which values of  $x$  do these series converge?

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

$$(b) \sum_{n=1}^{\infty} \left(\frac{x}{6}\right)^n$$

$$(c) \frac{x}{1} + \frac{x^2}{4} + \frac{x^3}{9} + \frac{x^4}{16} + \frac{x^5}{25} + \dots$$

$$(d) \frac{(x-4)}{1} + \frac{(x-4)^2}{2} + \frac{(x-4)^3}{3} + \frac{(x-4)^4}{4} + \frac{(x-4)^5}{5} + \dots$$