b) $\sum_{1}^{\infty} \frac{(n+4)!}{2^n n^2 (n+1)!}$

$a_{n+1} = \frac{n+5}{2^{n+1}(n+1)^2(n+2)}$

$= \frac{(n+4)\cancel{n!}}{2^n n^2 (n+1)\cancel{n!}}$

$\frac{a_{n+1}}{a_n} = \frac{n+5}{2^{n+1}(n+1)^2(n+2)} \cdot \frac{2^n n^2 (n+1)}{n+4}$

$a_n = \frac{n+4}{2^n n^2 (n+1)}$

$= \frac{n^2(n+5)}{2(n+1)(n+2)(n+4)} = \frac{n^3+5n^2}{2n^3+14n^2+28n+16}$

$\lim_{n \to \infty} \frac{n^3+5n^2}{2n^3+14n^2+28n+16} = \lim_{n \to \infty} \frac{\cancel{n^3}}{2\cancel{n^3}} = \frac{1}{2}$

Converge por Criterio de la razon.

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Solucion I

$x^5 - 6x^3 - 8x^2 \cdot 3x$ raiz $= x = -1.$

$P_{(x)} = x^5 \cdot 6x^3 - 8x^2 - 3x$
$P(-1) = -1 + 6 - 8 - 3 = P(-1) = 0$ $=$ $P'(x) = 5x^4 - 18x^2 - 16x - 3$
$P'(-1) = 5 - 18 + 16 - 3$
$P'(1) = 0$

$=$ $P''(x) = 20x^3 - 36x - 16$
$P''(-1) = -20 + 36 - 16$
$P''(-1) = 0.$

Solucion II

a) $\sum_{1}^{\infty} \frac{2n^2}{(3n-2)(3n+1)}$

$= \frac{2n^2}{9n^2 - 3n - 2}$

$\lim_{n\to\infty} \frac{2n^2}{9n^2 \cdot 3n \cdot 2} = \lim_{n\to\infty} \frac{2n^2}{9n^2} = \frac{2}{9} \neq 0$

Diverge.