a) $x^5 - 6x^3 - 8x^2 - 3x$ raíz $\Rightarrow x = -1$

$x=-1$ $(-1)^5 - 6(-1)^3 - 8(-1)^2 - 3(-1) = 0$ //

) $f'(x) = 5x^4 - 18x^2 - 16x - 3$

Evaluamos con $x=-1$ $5(-1)^4 - 18(-1)^2 - 16(-1) - 3$

$5 - 18 + 16 - 3 = 0$ //

$f''(x) = 20x^3 - 36x - 16$

$x=-1$ $20(-1)^3 - 36(-1) - 16$

$-20 + 36 - 16 = 0$ //

b)

c) $x(x^4 - 6x^2 - 8x - 3)$

$$\frac{x^4 - 6x^2 - 8x - 3}{x+1} = x^3 + \frac{\cancel{-x^3} - \cancel{6x^2} - 8x}{x+1}$$

$$x^3 - x^2 + \frac{-5x^2 - 8x - 3}{x+1} \Rightarrow x^3 - x^2 - 5x \frac{-3x - 3}{x+1}$$

$\Rightarrow x^3 - x^2 - 5x - 3$ $\pm 1 \pm 3$

$(x+1) \cdot -$

$-x^3 - x^2$

$\frac{-5x^2}{x}$

$(x+1) -5x$

$-5x^2 - 5x$

$(x+1) -$

$-3x + $

2) a) $\sum_{n=1}^{\infty} \frac{2n^2}{(3n-2)(3n+1)}$ $a_n = \frac{2n^2}{9n^2-3n-2}$ $\lim_{n\to\infty} \frac{2\cancel{n^2}}{9\cancel{n^2}} = \frac{2}{9} \neq 0$

Diverge por criterio de divergencia

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

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

$\frac{a_{n+1}}{a_n} \Rightarrow \frac{n+5}{\cancel{2^{n+1}}(n+1)^{\cancel{2}}(n+2)} \cdot \frac{\cancel{2^n} n^2 \cancel{(n+1)}}{n+4} = \frac{n^2(n+5)}{2(n+1)(n+2)(n+4)} = \frac{n^3+5n^2}{2n^3+14n^2+28n+16}$

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

Converge
por criterio de la razon

① $\sum_{n=1}^{\infty} \frac{(-1)^n (x-5)^n}{2^n (3n+2)}$

$a_n = \frac{(-1)^n}{2^n(3n+2)}$ $(x-5)^n$

$a_{n+1} = \frac{(-1)^{n+1}}{2^{n+1}(3n+3)} \Rightarrow \frac{a_{n+1}}{a_n}$

$\left| \frac{\cancel{(-1)^{n+1}}}{\cancel{2^{n+1}}(3n+3)} \cdot \frac{\cancel{2^n}(3n+2)}{\cancel{(-1)^n}} \right| = \left| \frac{-1(3n+2)}{2(3n+5)} \right| = \frac{1}{2} = L$

$R = \frac{1}{\frac{1}{2}} = \frac{2}{1} = 2$ $R \Rightarrow [5-2, 5+2]$

$[3, 7]$