1.
- $f(x) = ln(x+1)^2$
- orden 3
- $x_0 = 0$

- $f(x) = \ln(x+1)^2 \Rightarrow f(0) = 0$
- $f'(x) = 2\ln(x+1)\frac{1}{x+1} \Rightarrow f'(0) = 0$
- $f''(x) = \frac{2}{(x+1)^2} - \frac{2\ln(x+1)}{(x+1)^2} \Rightarrow f''(0) = 2$
- $f'''(x) = \frac{4\ln(x+1)-6}{(x+1)^3} \Rightarrow f'''(0) = -6$

$\Rightarrow P_3(x) = 2\frac{x^2}{2!} - 6\frac{x^3}{3!} = x^2 - x^3$

2.
- $g(x) = e^{x+2}$
- orden 3
- $x_0 = 0$

- $g(x) = e^{x+2} \Rightarrow g(0) = e^2$
- $g'(x) = e^{x+2} \Rightarrow g'(0) = e^2$
- $g''(x) = e^{x+2} \Rightarrow g''(0) = e^2$
- $g'''(x) = e^{x+2} \Rightarrow g'''(0) = e^2$

$\Rightarrow P_3(x) = e^2(1 + x + \frac{x^2}{2} + \frac{x^3}{6})$

3.
- $p(x) = x^4 - 5x^3 + 5x^2 + x + 2$
- potencias de $x - 2$

- $p(x) = x^4 - 5x^3 + 5x^2 + x + 2$
- orden 4
- $x_0 = 2$

- $p(x) = x^4 - 5x^3 + 5x^2 + x + 2 \Rightarrow p(2) = 16 - 5\cdot 8 + 5\cdot 4 + 2 + 2 = 0$
- $p'(x) = 4x^3 - 15x^2 + 10x + 1 \Rightarrow p'(2) = -7$
- $p''(x) = 12x^2 - 30x + 10 \Rightarrow p''(2) = -2$
- $p'''(x) = 24x - 30 \Rightarrow p'''(2) = 18$
- $p''''(x) = 24 \Rightarrow p'''(2) = 24$

$\Rightarrow P_4(x) = -7(x-2) - 2\frac{(x-2)^2}{2!} + 18\frac{(x-2)^3}{3!} + 24\frac{(x-2)^4}{4!} = -7(x-2) - (x-2)^2 + 3(x-2)^3 + (x-2)^4$

4.
- $g(x) = \sqrt{x}$
- potencias de $x - 1$
- orden 3
- $x_0 = 1$

- $g(x) = \sqrt{x} \Rightarrow g(1) = 1$
- $g'(x) = \frac{1}{2\sqrt{x}} \Rightarrow g'(1) = \frac{1}{2}$
- $g''(x) = \frac{-1}{4x^{\frac{3}{2}}} \Rightarrow g''(1) = -\frac{1}{4}$
- $g'''(x) = \frac{3}{8x^{\frac{5}{2}}} \Rightarrow g'''(1) = \frac{3}{8}$

$\Rightarrow P_4(x) = 1 + \frac{1}{2}(x-1) - \frac{1}{4}\frac{(x-1)^2}{2!} + \frac{3}{8}\frac{(x-1)^3}{3!} = 1 + \frac{(x-1)}{2} - \frac{(x-1)^2}{8} + \frac{(x-1)^3}{16} =$