ES N1 PAG 358

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

$p'(x) = 3x^2 - 8x$

$p''(x) = 6x - 8$

$p'''(x) = 6$

$p(x) = p(x_0) + p'(x_0)(x-x_0) + \frac{1}{2!}p''(x_0)(x-x_0)^2 + \frac{1}{3!}p'''(x_0)(x-x_0)^3$

$p(-2) = (-2)^3 - 4(-2)^2 + 5 = -19$

$p'(-2) = 3(-2)^2 - 8(-2) = 28$

$p''(-2) = 6(-2) - 8 = -20$

$p'''(-2) = 6$

$p(x) = -19 + 28(x+2) - 10(x+2)^2 + (x+2)^3$

ES. N5

$x_0 = 0$ ordine 4

$f(x) = \frac{1}{1+x^2}$

$f(x) = f(0) + f'(0)x + \frac{f''(0)}{2}x^2 + \frac{f'''(0)}{6}x^3 + \frac{f^{IV}(0)}{24}x^4$

$f(x) = \frac{1}{1+x^2} \qquad f(0) = 1$

$f'(x) = \frac{-2x}{(1+x^2)^2} \qquad f'(0) = 0$

$f''(x) = \frac{-2(1+x^2)^2 + 2x\left[2(1+x^2)2x\right]}{(1+x^2)^4} = \frac{-2+6x^2}{(1+x^2)^3} \qquad f''(0) = -2$

$f'''(x) = \frac{12x(1+x^2)^3 - 6x^2\left[3(1+x^2)^2(2x)\right]}{(1+x^2)^8} =$

$= \frac{(1+x^2)^2\left[12x + 12x^3 - 36x^3\right]}{(1+x^2)^{8\,6}} = \frac{12x - 24x^3}{(1+x^2)^6}$

$f'''(0) = 0$

$f^{(IV)}(x) = \frac{(12-72x^2)(1+x^2)^6 - (12x-24x^3)6(1+x^2)^5 2x}{(1+x^2)^{12}\,7} =$

$= \frac{12+12x^2-72x^2-72x^4-144x^2+288x^4}{(1+x^2)^7} \qquad f^{IV}(0) = 12$

$f(x) = 1 + \frac{1}{2}(-2)x^2 + \frac{1}{24}12x^4 = 1 - x^2 + \frac{1}{2}x^4$

ES 26

$\sqrt{1,07}$ al terzo grado

$1,07 = 1 + 0,07$ $\qquad x_0 = 0,07$

$f(x) = \sqrt{1+x}$

$f(x) = f(x_0) + f'(x_0)(x-x_0) + \frac{1}{2} f''(x_0)(x-x_0)^2 + \frac{f'''(x_0)}{6}(x-x_0)^3$

$f'(x) = \frac{1}{2\sqrt{1+x}}$