$-0.1 \quad -0.15 \quad -0.5 \quad -0.25 \quad +1.2$

$$f(x) = -0.1x^4 - 0.15x^3 - 0.5x^2 - 0.25x + 1.2$$

Predecir el valor en $x=1$, con $h=1$, usando la Serie de Taylor de orden cero hasta con 4 y calculando el residuo en cada caso.

n	Aproximación $F(x=1)$	R_n	$E = f(1) - \text{aprox}$
0	1.2	-0.91	-1
1	0.95	-0.875	-0.75
2	0.45	-0.35	-0.25
3	0.3	-0.1	-0.1
4	0.2	0	0

$$R_n = \frac{f^{(n+1)}(\xi)(x_{i+1} - x_i)^n}{(n+1)!} \quad \Bigg\} \quad \xi = 0.5$$

$0 \rightarrow 1$

$\downarrow$

0.5

$f'(x) = -0.4x^3 - 0.45x^2 - x - 0.25 \qquad R_n = f'(\xi)/1$

$f''(x) = -1.2x^2 - 0.9x - 1 \qquad R_n = f''(\xi)/2$

$f'''(x) = -2.4x - 0.9 \qquad R_n = f'''(\xi)/6$

$f^{IV}(x) = -2.4 \qquad R_n = f^{IV}(\xi)/24$

$f^{V}(x) = 0 \qquad \rightarrow R_n = 0$

$f(x) = \cos(x)$, $x = \pi/3$ usando serie de Taylor
Orden 0 → 4 entorno a $x = \frac{\pi}{4}$

n	aproximación $f(x=\pi/3)$	R_n	$E = f(1) -$ aprox
0	0.707	-0.79	-0.207
1	0.522	-0.0208	-0.022
2	0.497	0.0023	0.003
3	0.499^8	0.0001	0.001
4	0.499^7	-0.000008	0.001

$$\left.\begin{matrix} 6\pi/24 = x_i = \pi/4 \\ 8\pi/24 = x_{i+1} = \pi/3 \end{matrix}\right\} \begin{matrix} h = \pi/3 - \pi/4 = \pi/12 \\ \xi = 7\pi/24 \end{matrix}$$

$f'(x) = -\operatorname{sen}(x)$ 1 $R_n = -0.79$

$f''(x) = -\cos(x)$ 2 $R_n = -0.0208$

$f'''(x) = \operatorname{sen}(x)$ 6 $R_n = 0.0023$

$f^{IV}(x) = \cos(x)$ 24 $R_n = 0.0001$

$f^{V}(x) = -\operatorname{sen}(x)$ 120 $R_n = -0.000008$

$$R_n = \frac{f^{(n+1)}(\xi)(x_{i+1} - x_i)^n}{(n+1)!} \quad \Big\} \quad \xi = \frac{7\pi}{24}$$