Métodos Numéricos – Prof. Luis Edo. Amaya

Fórmulas de Diferenciación Numérica	
$n=2$	$f'(x)=\frac{f(x_0+h)-f(x_0)}{h}-\frac{h}{2}f''(\xi)$
$n=3$	$f'(x)=\frac{1}{2h}[-3f(x_0)+4f(x_0+h)-f(x_0+2h)]-\frac{h^2}{3}f^{(3)}(\xi)$
$n=3$	$f'(x)=\frac{1}{2h}[f(x_0+h)-f(x_0-h)]-\frac{h^2}{6}f^{(3)}(\xi)$
$n=3$	$f''(x)=\frac{1}{h^2}[f(x_0-h)-2f(x_0)+f(x_0+h)]-\frac{h^2}{12}f^{(4)}(\xi)$
$n=5$	$f'(x)=\frac{1}{12h}[f(x_0-2h)-8f(x_0-h)+8f(x_0+h)-f(x_0+2h)]-\frac{h^4}{30}f^{(5)}(\xi)$
$n=5$	$f'(x)=\frac{1}{12h}[-25f(x_0)+48f(x_0+h)-36f(x_0+2h)+16f(x_0+3h)-3f(x_0+4h)]-\frac{h^4}{5}f^{(5)}(\xi)$

Fórmulas de Integración Numérica		
n	Fórmulas Cerradas	Fórmulas Abiertas
0	$x_i=x_0+i\cdot h \quad h=\frac{b-a}{n}$	$2hf(x_0)+\frac{h^3}{3}f''(\xi)$
1	$\frac{h}{2}[f(x_0)+f(x_1)]-\frac{h^3}{12}f''(\xi)$	$\frac{3h}{2}[f(x_0)+f(x_1)]+\frac{3h^3}{4}f''(\xi)$
2	$\frac{h}{3}[f(x_0)+4f(x_1)+f(x_2)]-\frac{h^5}{90}f^{(4)}(\xi)$	$\frac{4h}{3}[2f(x_0)-f(x_1)+2f(x_2)]+\frac{14h^5}{45}f^{(4)}(\xi)$
3	$\frac{3h}{8}[f(x_0)+3f(x_1)+3f(x_2)+f(x_3)]-\frac{3h^5}{80}f^{(4)}(\xi)$	$\frac{5h}{24}[11f(x_0)+f(x_1)+f(x_2)+11f(x_3)]+\frac{95h^5}{144}f^{(4)}(\xi)$
4	$\frac{2h}{45}[7f(x_0)+32f(x_1)+12f(x_2)+32f(x_3)+7f(x_4)]-\frac{8h^7}{945}f^{(6)}(\xi)$	$x_i=x_0+i\cdot h \quad h=\frac{b-a}{n+2}$

Reglas Compuestas	
Simpson	$\frac{h}{3}\left[f(x_0)+2\sum_{j=1}^{\left(\frac{n}{2}\right)-1}f(x_{2j})+4\sum_{j=1}^{\left(\frac{n}{2}\right)}f(x_{2j-1})+f(x_n)\right]-\frac{x_n-x_0}{180}h^4f^{(4)}(\mu)$
Trapecio	$\frac{h}{2}\left[f(x_0)+2\sum_{j=1}^{n-1}f(x_j)+f(x_n)\right]-\frac{x_n-x_0}{12}h^2f^{(2)}(\mu)$ $h=\frac{x_n-x_0}{n} \quad x_j=x_0+j\cdot h$
Punto Medio	$2h\sum_{j=0}^{\left(\frac{n}{2}\right)}f(x_{2j})-\frac{x_n-x_0}{6}h^2f^{(2)}(\mu)$ $h=\frac{x_n-x_0}{n+2} \quad x_j=x_0+(j+1)h$