EJERCICIO 03.

3 PUNTOS: $\{t_{n+1}, f_{n+1}\}$; $\{t_n, f_n\}$; $\{t_{n-1}, f_{n-1}\}$.

- $P_2(t) = f_{n+1} \left[\dfrac{t - t_n}{t_{n+1} - t_n}\right]\left[\dfrac{t - t_{n-1}}{t_{n+1} - t_{n-1}}\right] + f_n \left[\dfrac{t - t_{n+1}}{t_n - t_{n+1}}\right]\left[\dfrac{t - t_{n-1}}{t_n - t_{n-1}}\right] + f_{n-1} \left[\dfrac{t - t_{n+1}}{t_{n-1} - t_{n+1}}\right]\left[\dfrac{t - t_n}{t_{n-1} - t_n}\right].$

$\Rightarrow P_2(t) = \dfrac{f_{n+1}}{2h^2}[t - t_n][t - t_{n-1}] + \dfrac{f_n}{-h^2}[t - t_{n+1}][t - t_{n-1}] + \dfrac{f_{n-1}}{2h^2}[t - t_{n+1}][t - t_n].$

- $y_{n+1} = y_n + \dfrac{5h}{12} f_n + \dfrac{2h}{3} f_{n-1} - \dfrac{h}{12} f_{n-2}.$

4 PUNTOS: $\{t_{n+1}, f_{n+1}\}$; $\{t_n, f_n\}$; $\{t_{n-1}, f_{n-1}\}$; $\{t_{n-2}, f_{n-2}\}$.

- $P_3(t) = f_{n+1} \left[\dfrac{t - t_n}{t_{n+1} - t_n}\right]\left[\dfrac{t - t_{n-1}}{t_{n+1} - t_{n-1}}\right]\left[\dfrac{t - t_{n-2}}{t_{n+1} - t_{n-2}}\right] + f_n \left[\dfrac{t - t_{n+1}}{t_n - t_{n+1}}\right]\left[\dfrac{t - t_{n-1}}{t_n - t_{n-1}}\right]\left[\dfrac{t - t_{n-2}}{t_n - t_{n-2}}\right]$

$+ f_{n-1}\left[\dfrac{t - t_{n+1}}{t_{n-1} - t_{n+1}}\right]\left[\dfrac{t - t_n}{t_{n-1} - t_n}\right]\left[\dfrac{t - t_{n-2}}{t_{n-1} - t_{n-2}}\right] + f_{n-2}\left[\dfrac{t - t_{n+1}}{t_{n-2} - t_{n+1}}\right]\left[\dfrac{t - t_n}{t_{n-2} - t_n}\right]\left[\dfrac{t - t_{n-1}}{t_{n-2} - t_{n-1}}\right]$

$\Rightarrow P_3(t) = \dfrac{f_{n+1}}{6h^3}[t - t_n][t - t_{n-1}][t - t_{n-2}] + \left[\dfrac{f_n}{-2h^3}\right][t - t_{n+1}][t - t_{n-1}][t - t_{n-2}]$

$+ \dfrac{f_{n-1}}{2h^3}[t - t_{n+1}][t - t_n][t - t_{n-2}] - \dfrac{f_{n-2}}{6h^3}[t - t_{n+1}][t - t_n][t - t_{n-1}].$

- $y_{n+1} = y_n + \dfrac{3h}{8} f_{n+1} + \dfrac{15h}{24} f_n - \dfrac{5h}{24} f_{n-1} + \dfrac{h}{24} f_{n-2}$