$$f(x+h) = f(x) + \cancel{h f'(x)} + \frac{h^2}{2} f''(x) + \cancel{\frac{h^3}{3!} f'''(x)} + \frac{h^4}{4!} f''''(x)$$
$$+ \cancel{\frac{h^5}{5!} f'''''(x)} + \frac{h^6}{6!} f''''''(x)$$

$$f(x-h) = f(x) - \cancel{h f'(x)} + \frac{h^2}{2} f''(x) - \cancel{\frac{h^3}{3!} f'''(x)} + \frac{h^4}{4!} f''''(x)$$
$$- \cancel{\frac{h^5}{5!} f'''''(x)} + \frac{h^6}{6!} f''''''(x)$$

$$f(x+h) + f(x+h) = 2f(x) + 2\frac{h^2}{2} f''(x) + \frac{2h^4}{4!} f''''(x)$$
$$+ \frac{h^6}{6!} f''''''(x)$$

$$f(x+2h) = f(x) + \cancel{2h f'(x)} + \frac{(2h)^2}{2} f''(x) + \cancel{\frac{(2h)^3}{3!} f'''(x)}$$
$$+ \frac{(2h)^4}{4!} f''''(x) + \cancel{\frac{(2h)^5}{5!} f'''''(x)} + \frac{(2h)^6}{6!} f''''''(x)$$

$$f(x-2h) = f(x) - \cancel{2h f'(x)} + \frac{(2h)^2}{2} f''(x) - \cancel{\frac{(2h)^3}{3} f'''(x)}$$
$$+ \frac{(2h)^4}{4!} f''''(x) - \cancel{\frac{(2h)^5}{5!} f'''''(x)} + \frac{(2h)^6}{6!} f''''''(x)$$

$$f(x+2h) + f(x+2h) =$$
$$2f(x) + 2\frac{(2h)^2}{2} f''(x) + \frac{2(2h)^4}{4!} f''''(x) + \frac{2(2h)^6}{6!} f''''''(x)$$

- Resolviendo entre $f(x+h)$, $f(x-h)$, $f(x+2h)$ y $f(x-2h)$ para obtener $f''''(x)$

$f(x+h) = f(x_{i+1})$
$f(x-h) = f(x_{i-1})$
$f(x+2h) = f(x_{i+2})$
$f(x-2h) = f(x_{i-2})$

Se obtiene la derivada inicial. Resolviendo entre $f(x+h)$ y $f(x-h)$ para hallar $f''''(x)$:

$$f''''(x) \downarrow$$

$$f(x+h) + 2f(x) - f(x-h) + \frac{2h^2}{2} f''(x) + \frac{2h^6}{6!} f''''''(x)$$

$$\frac{4! \cdot \frac{\cancel{2} h^{\cancel{6}\,2}}{6!} f''''''(x)}{\cancel{2} h^4} = \frac{4! h^2}{6!} f''''''(x) \longrightarrow (O h^2)$$