$$D^4 f(x_i) \cong \frac{f(x_i+2) - 4f(x_i+1) + 6f(x_i) - 4f(x_i-1) + f(x_i-2)}{h^4}$$

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

$$\frac{f((x_i+1)+1) - 4f(x_i+1) + 6f(x_i) - 4f(x_i-1) + f((x_i-1)-1)}{\cancel{h^4}}$$

$$\|$$

$$\frac{-4\left(-8\cancel{f(x)} - \cancel{4h^2 f''(x)} - \frac{8h^4}{4!} f^4(x)\right) + \cancel{6f(x)} + \cancel{2f(x)} + \cancel{4h^2 f''(x)} + \frac{32h^4}{4!} f^4(x)}{\cancel{h^4}}$$

$$f(x+2) = f(x+2h) \qquad f(x-2h)$$

$$
\begin{array}{rl}
 & f(x) + \cancel{2hf'(x)} + \frac{4h^2}{2} f''(x) + \cancel{\frac{8h^3}{3!} f'''(x)} + \frac{16h^4}{4!} f^4(x) \\
+ & f(x) - \cancel{2hf'(x)} + \frac{4h^2}{2} f''(x) - \cancel{\frac{8h^3}{3!} f'''(x)} + \frac{16h^4}{4!} f^4(x) \\
\hline
 & 2f(x) + 4h^2 f''(x) + \frac{32h^4}{4!} f^4(x)
\end{array}
$$

$$0 - \frac{f(x+2h) - 4f(x+h) + 6f(x) - 4f(x-h) + f(x-2h)}{h^4} = f^{4}(x)$$

Por tanto el operador $= 0$