d) Tenemos que:

$$f'(x_i) \cong \frac{f(x_{i+1}) - f(x_{i-1})}{2h}$$

$$f''(x_i) \cong \frac{f'(x_{i+1}) - f'(x_{i-1})}{2h}$$

$$\cong \frac{\left(\frac{f(x_{i+1+1}) - f(x_{i-1+1})}{2h}\right) - \left(\frac{f(x_{i+1-1}) - f(x_{i-1-1})}{2h}\right)}{2h}$$

$$\cong \frac{\left(\frac{f(x_{i+2}) - 2f(x_i) + f(x_{i-2})}{2h}\right)}{2h}$$

$$f''(x_i) = \frac{f(x_{i+2}) - 2f(x_i) + f(x_{i-2})}{4h^2}$$

3)

d. Si para $f'(x) = \frac{f(x+h) - f(x-h)}{h^2}$ tenemos la máscara de convolución $[1,0,-1]$ entonces para $D^2(x)$ tendremos $[1,2,1]$ haciendo

$$D^2 f(x_n) = \frac{1}{h^2} \sum_{m=-1}^{1} M[m+1]\, f(x_{n-m}) \qquad M = [1,2,1]$$