HW4

You were required to write the formula, used to determine the masks, in terms of derivatives ⇒

-1	-1	-1
-1	9	-1
-1	-1	-1

$$\text{for } (x,y) = 9 f(x,y) - f(x-1,y-1) - f(x,y-1) -$$
$$- f(x+1,y-1) - f(x-1,y) - f(x+1,y) -$$
$$- f(x-1,y+1) - f(x,y+1) - f(x+1,y+1) =$$

$$= f(x,y) - \nabla^2 f(x,y) - [f(x-1,y-1) + f(x+1,y-1)$$
$$+ f(x-1,y+1) + f(x+1,y+1) - 4 f(x,y)] = f(x,y) - \nabla^2 f(x,y) - D_2$$
$$= f(x,y) \neq [\nabla^2 f(x,y) + D_{(-1,-1)} f + D_{(1,-1)} f + D_{(-1,1)} f + D_{(1,1)} f]$$

$$\text{where } D_{(a,b)} f \approx f(x+a, y+b) - f(x,y)$$