Name: _____ Roll Number: _____

1. (10 points) Show that the Laplacian

$$\Delta u = u_{xx} + u_{yy}$$

for pixel i can be written as

$$\frac{1}{h^2} \sum_{j \in \mathcal{N}_i} (u_j - u_i)$$

where set $\mathcal{N}_i$ is the 4-neighbourhood (top, down, left, right) of pixel i and h is the distance between pixels (you may assume it to be 1).