Problem 138B

A finite difference method applied to a partial differential equation utilizes a mesh with a uniform node spacing, h, in the x and y directions as shown in the sketch. Find the finite difference approximation for the term

$$\frac{\partial^2 \phi}{\partial x \partial y} \tag{1}$$

at the generic node labelled 0 using some or all of the surrounding nodes labelled 1 to 8.