Let's go back to the 2D problem,

$$\nabla^2 V(x,y) = \frac{\partial^2 V}{\partial x^2} + \frac{\partial^2 V}{\partial y^2} = 0$$

We can develop an approximate form for this PDE, by approximating the derivative,

$$\frac{\partial^2 V}{\partial x^2} = \frac{V(x+a,y) - 2V(x,y) + V(x-a,y)}{a^2}$$

$$\frac{\partial^2 V}{\partial y^2} = \frac{V(x,y+a) - 2V(x,y) + V(x,y-a)}{a^2}$$

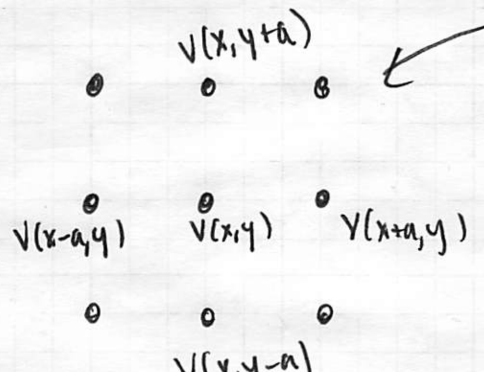
so that,

$$\frac{\partial^2 V}{\partial x^2} + \frac{\partial^2 V}{\partial y^2} = \frac{V(x+a,y) + V(x,y+a) + V(x-a,y) + V(x,y-a) - 4V(x,y)}{a^2}$$

B/c $\nabla^2 V(x,y) = 0$,

$$V(x,y) = \frac{1}{4}\left[V(x+a,y) + V(x,y+a) + V(x-a,y) + V(x,y-a)\right]$$

V @ x,y is average of surrounding pts!



these pts. we call the mesh.

to find V(x,y), we successively average over the surrounding mesh pts.