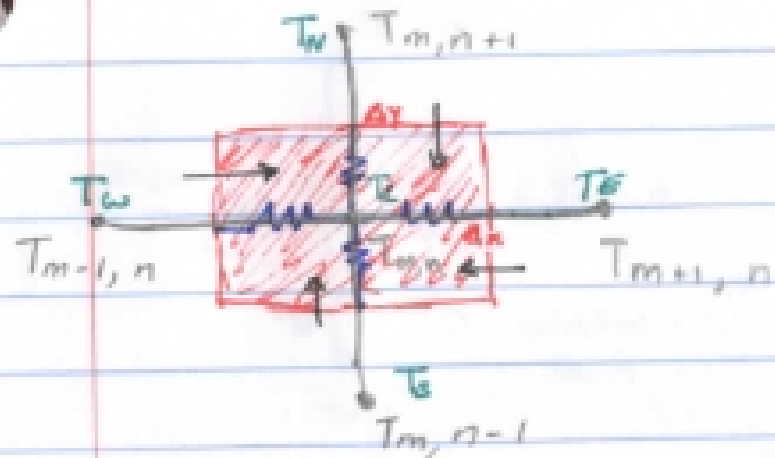
Interior nodes - case 1

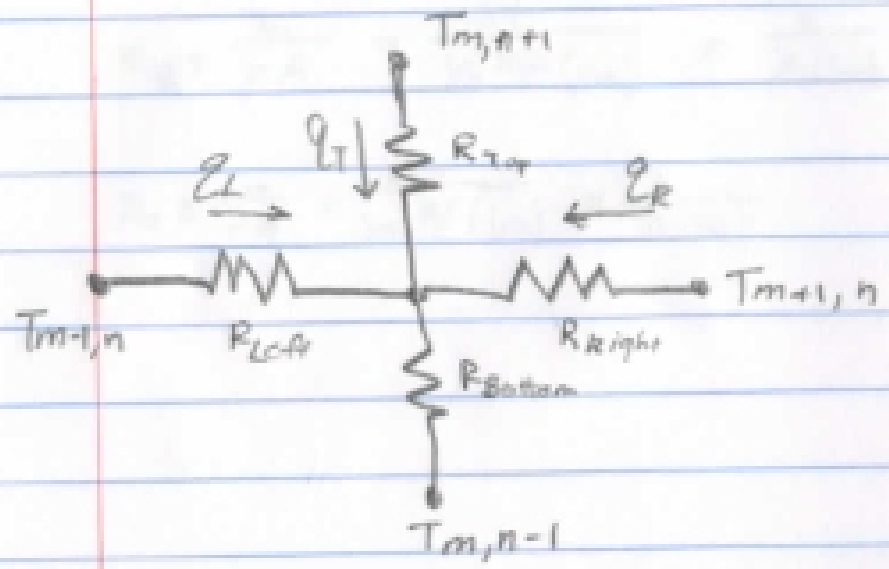


Assume: $\Delta x = \Delta y$ → aspect ratio $l_{/a} = \frac{\Delta x}{\Delta y} = 1$

$$KCL = \sum_{node} I_i = 0$$

$$\cancel{\dot{E}_{st}} = \dot{E}_{in} - \dot{E}_{out} + \cancel{\dot{E}_{gen}}$$

$$\sum \dot{E}_{in} = 0$$



$$q_L = \frac{T_{m-1,n} - T_{m,n}}{R_L} \qquad R_L = \frac{L}{kA} = \frac{\Delta x}{k\,\Delta y\,(1m)} = \frac{1}{k(1m)}$$

$$+ \quad q_R = \frac{T_{m+1,n} - T_{m,n}}{R_R} \qquad R_R = \frac{L}{kA} = \frac{\Delta x}{k\Delta y(1m)} = \frac{1}{k(1m)}$$

$$+ \quad q_T = \frac{T_{m,n+1} - T_{m,n}}{R_T} \qquad R_T = \frac{L}{kA} = \frac{\Delta y}{k\Delta x(1m)} = \frac{1}{k(1m)}$$

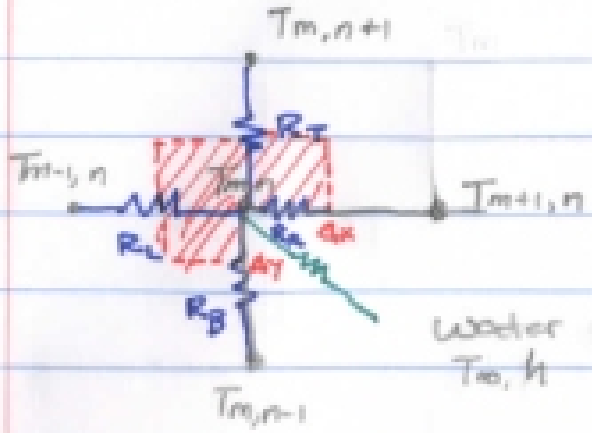
$$+ \quad q_B = \frac{T_{m,n-1} - T_{m,n}}{R_B} \qquad R_B = \frac{L}{kA} = \frac{\Delta y}{k\Delta x(1m)} = \frac{1}{k(1m)}$$

$$0$$

$$T_{m-1,n} + T_{m+1,n} + T_{m,n+1} + T_{m,n-1} - 4T_{m,n} = 0$$

$$(T_L) + (T_R) + (T_T) + (T_B) - (4T_C) = 0$$

Node at an internal corner with convection — case 2



$$R_T = R_L = \frac{1}{k(1m)}$$

$$R_B = \frac{L}{kA} = \frac{\Delta y}{k\frac{\Delta x}{2}(1m)} = \frac{2}{k(1m)}$$

$$R_R = \frac{L}{kA} = \frac{\Delta x}{k\frac{\Delta y}{2}(1m)} = \frac{2}{k(1m)}$$