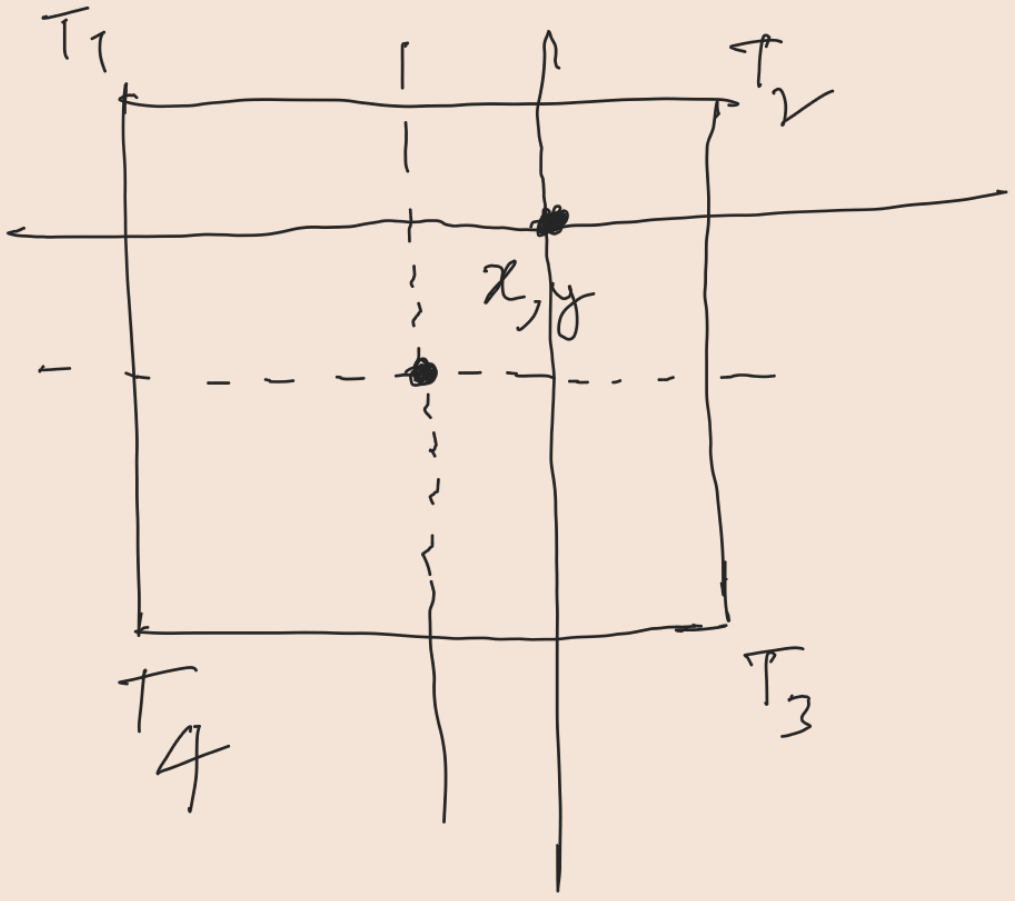


$$(T_1 + T_2)\left(\frac{l}{2} - y\right) = (T_3 + T_4)\left(\frac{l}{2} + y\right)$$

$$(T_2 + T_3)\left(\frac{l}{2} - x\right) = (T_1 + T_4)\left(\frac{l}{2} + x\right)$$

$$T_2 + T_4 = T_1 + T_3$$

$$(T_2 + T_3)\left(\frac{l}{2} - x\right) = (2T_1 + T_3 - T_2)\left(\frac{l}{2} + x\right)$$

$$T_2\left(\frac{l}{2}-x+\frac{l}{2}+x\right)=2T_1\left(\frac{l}{2}+x\right)$$

$$+T_3\left(\frac{l}{2}+x-\frac{l}{2}+x\right)$$

$$(T_2)l=2T_1\left(\frac{l}{2}+x\right)+2T_3x$$

$$(T_1+T_2)\left(\frac{l}{2}-y\right)=(T_1+2T_3-T_2)\left(\frac{l}{2}+y\right)$$

$$T_2\left[\frac{l}{2}-y+\frac{l}{2}+y\right]=2T_3\left(\frac{l}{2}+y\right)$$

$$+T_1\left(\frac{l}{2}+y-\frac{l}{2}+y\right)$$

$$T_2 l = 2T_3\left(\frac{l}{2}+y\right) + 2T_1 y$$

$$2T_1\left(\frac{l}{2}+x-y\right) + 2T_3\left(x-\frac{l}{2}-y\right) = 0$$

Since T_1 & T_3 are +ve,

then, either

$$x-y+\frac{l}{2} > 0 \;\&\; x-y-\frac{l}{2} < 0$$

&

vice versa. This automatically covers all safe regions of the plate.