

W2-6-2 Temperature distribution 2

The temperature, T in degrees Celsius on a point (x, y) with x and y in metres on a flat metal plate is provided by $T(x, y) = \frac{60}{(1+x^2+y^2)}$. Find the change in temperature as a function of the distance in the point $(2, 1)$ in the x -direction.

In the x -direction it holds that $\left(\frac{\partial T}{\partial x}\right)_y = \frac{-120x}{(1+x^2+y^2)^2}$. In the point $(2, 1)$ this is equal to $-\frac{20}{3} = 6.67$ °C C per meter in the x -direction.