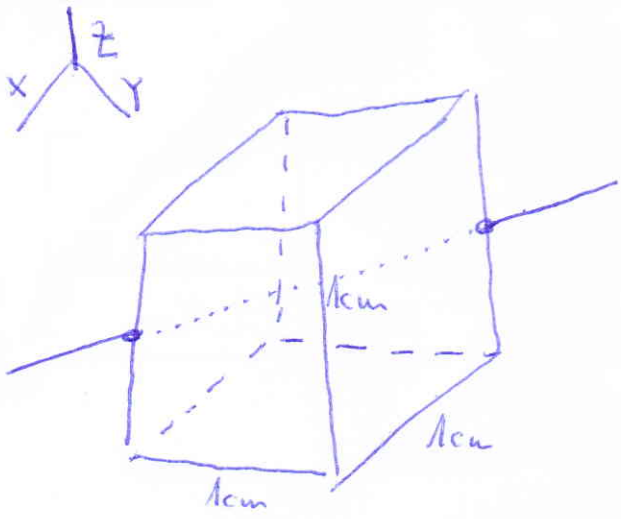

$f(x,y,z) = 3 + 2x + 3y - 2z$

If a ray crosses the cube as shown in the picture, diagonally through, the function that yields the density of the box in each point of the ray would be:

Line follows the equations:

$z = 0$'s horizontal plane

$x = 1 - y$ vertical diagonal plane

Applying substitution to the original function:

$f(x,y,z) = 3 + 2x + 3(1 - x) - 2 \cdot 0$'s

$f(x) = 3 + 2x - 3x + 3 - 1$

$f(x) = -x + 5$

This function represents what density the ray observes as it crosses the cube.