Problem 1

Find the average height of the paraboloid $z = x^2 + y^2$ over the square $0 \leq x \leq 2$, $0 \leq y \leq 2$.

Problem 2

Find the average value of $f(x, y) = \cos(16\pi x^5)$ on the region enclosed by the lines $x = y^{1/4}$, $x = 1/2$ and the first quadrant.