J00T.1—Ideal Gas In a Magnetic Field

Problem

A container C consists of two equal cubes joined together with a thin pipe through which gas can flow. We insert a monatomic, paramagnetic gas in C and it is at equilibrium at temperature T. The spin of each atom is $1/2$ and its magnetic moment is $g\mu_B$. The mass of each atom is m.

Next we place one of the cubes between the poles of a magnet which produces a field, H, in this cube, but not in the other. Assuming that there is no change in temperature and that the gas can be considered to be 'ideal', what is the ratio of the pressures in the two cubes?