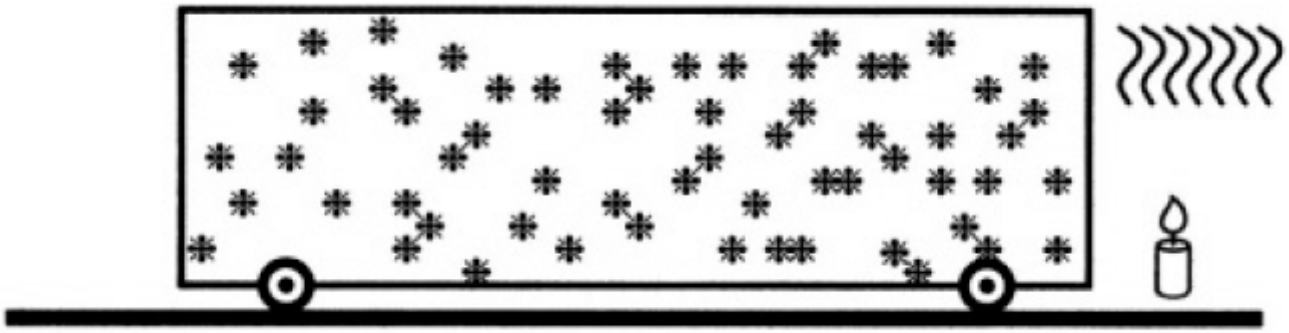
Dr. Sasha

Please, solve this problem and also show the steps to solve it.

30.05.2015 – N11

1) A long, cylindrical tank is placed on a carriage that can slide without friction on rails (see figure below). The mass of the empty tanker is $M = 180$ kg. Initially, the tank is filled with an ideal gas of mass $m = 120$ kg at a pressure $P_0 = 150$ atm at an ambient temperature $T_0 = 300$ K. Then one end of the tank is heated to 335 K while the other end is kept fixed at 300 K. Find the pressure in the tank and the new position of the center of mass of the tanker when the system reaches equilibrium.



2) The current I flowing along the edges of one face of a cube (see Figure P.3.31a) produces a magnetic field in the center of the cube of magnitude Consider another cube where the current I flows along a path shown in Figure P.3.31 b. What magnetic field will now exist at the center of the cube?

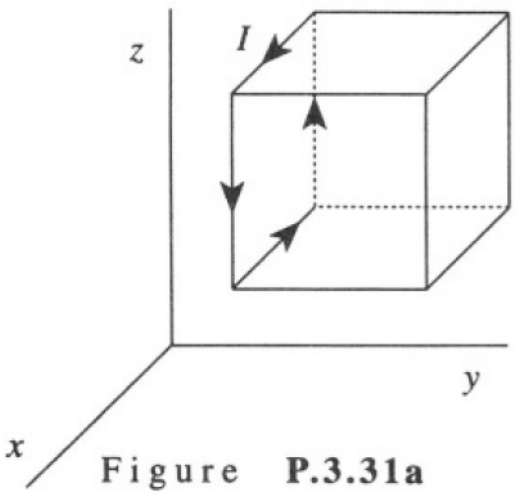


Figure **P.3.31a**

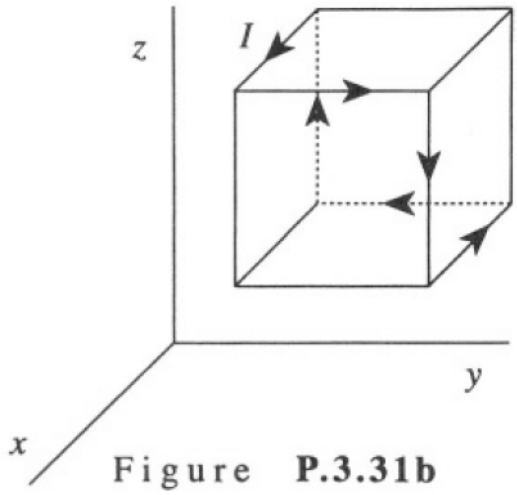


Figure **P.3.31b**