Math 142-1, Group work 9

Problem 1

A gas gas pushes on a slowly moving wall for a short time, thereby increasing the gas volume by a small amount ΔV. (Assume KE is the only energy in the gas.)

(a) Show that the gas does $P\Delta V$ work on the wall.

(b) Show using our gas model that the kinetic energy of the gas decreases by $P\Delta V$. It follows that energy is conserved under this scenario. (How does bouncing off a moving wall affect a particle's velocity?)

(c) If the gas increases in volume, what would you expect to happen to its temperature?

Problem 2

When deriving the ideal gas law, we assumed that particles do not interact. Consider instead that the gas molecules slightly attract one another. What affect would you expect this to have on the pressure of the gas and why?