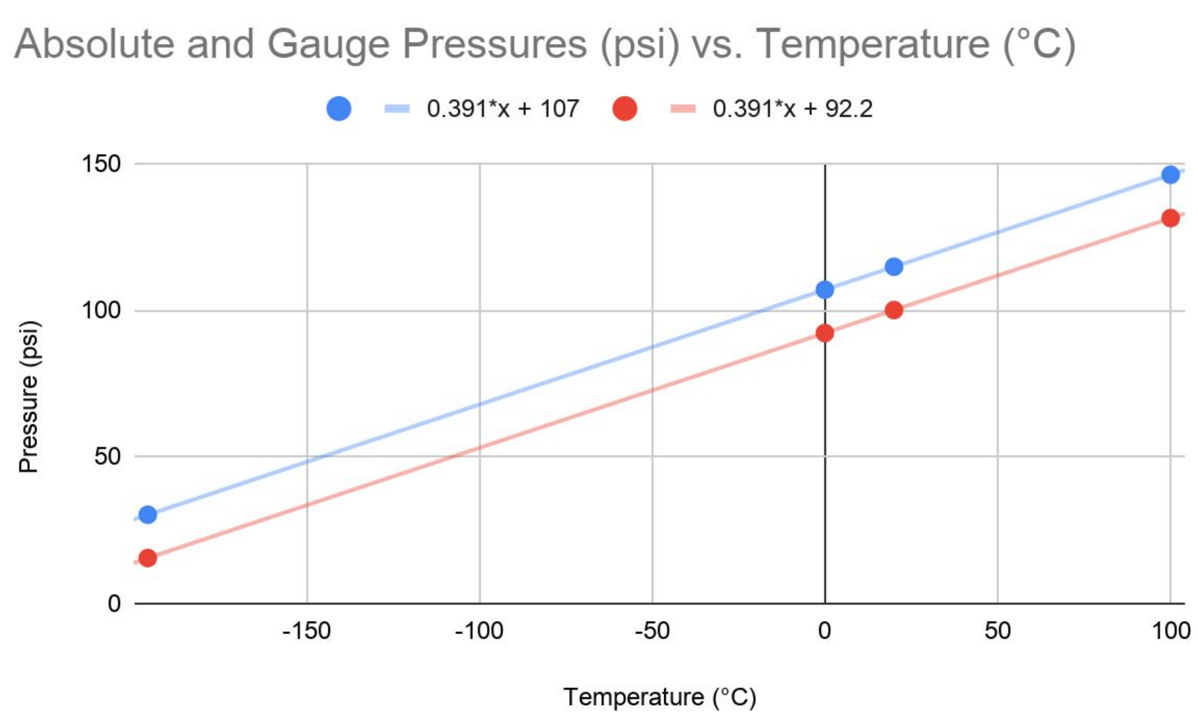
Via http://www.usairnet.com/, the current atmospheric pressure in my area is 30.03 Hg. Converting inches of mercury to pound-force per square inch delivers us a value of 14.75 psi.

From the lab, gauge pressure at 20 degrees Celsius is 100 psi, so absolute pressure is 114.75 psi. For a constant volume, P / T is a constant, so for all temperatures, P / T should be equal to 114.75 psi / 293.15 Kelvins = 0.39144 psi / Kelvin.

Temperature (°C)	Temperature (K)	Absolute Pressure (psi)	Gauge Pressure (psi)
100	373.15	146.07	131.32
20	293.15	114.75	100
0	273.15	106.92	92.17
-195.80 (boiling point of liquid nitrogen)	77.35	30.28	15.53

In the following graph, the blue line represents absolute pressure, while the red line represents gauge pressure.



Finding the x-intercept of the blue trendline reveals that at zero absolute pressure, temperature is -273.35 °C, or -0.2 K. A negative value of Kelvin is impossible, but its closeness to zero indicates general accuracy.

After discussion with others in PHYS-151 lab sections, it was determined that it is not known by us how to account for the effects of intermolecular forces of non-ideal gases, so one may take the above graph to represent an ideal gas, as well as helium and air, assuming they are ideal gases. That statement is of course a bit of a tautology, but it is the best we could do.