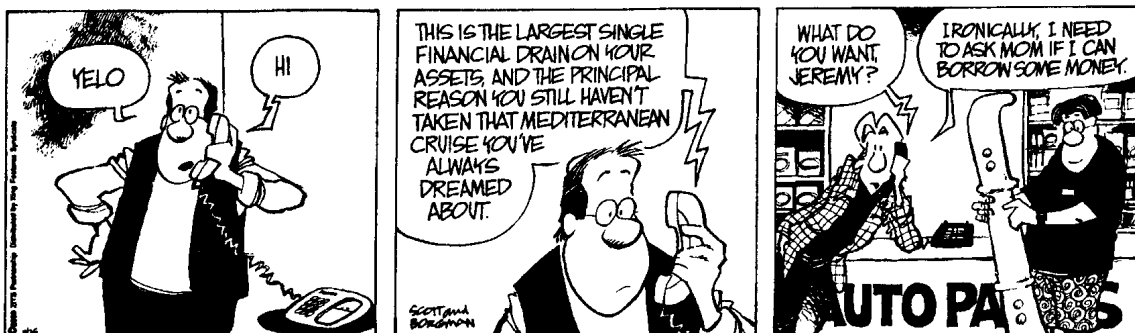


AP 2 Thermodynamics WS 1

Name: _____ Period: _____



But I cannot change the laws of physics, Captain! – Scotty to Kirk

1. Convert 25.6°C to Kelvin and Fahrenheit.
2. The lowest and highest natural temperatures ever recorded on earth are -127°F in Antarctica and 136°F in Libya. What are these temperatures in $^{\circ}\text{C}$ and in K?
3. How many atoms are in a $2.0\text{ cm} \times 2.0\text{ cm} \times 2.0\text{ cm}$ cube of aluminum? The density of aluminum is 2700 kg/m^3 .
4. How many moles are in a $2.0\text{ cm} \times 2.0\text{ cm} \times 2.0\text{ cm}$ cube of copper? The density of copper is 8920 kg/m^3 .
5. A gas is in a sealed container. The pressure is tripled and the temperature is doubled. What happens to the number of moles of gas in the container?

6. A gas is in a sealed container. By what factor does the pressure change if: a) the volume is doubles and the temperature is tripled? b) The volume is halved and the temperature is tripled?

7. 3.0 mol of gas at temperature of -120°C fills a 2.0 L container. What is the gas pressure?

8. A gas at 100°C fills volume V_0 . If the pressure is held constant, what is the volume if (a) the Celsius temperature is doubled and (b) the Kelvin temperature is doubled?

9. A rigid container holds 2.0 mol of gas at a pressure of 1.0 atm and a temperature of 30°C .
 - a. What is the container's volume?
 - b. What is the pressure if the temperature is raised to 130°C ?

10. What is the average kinetic energy per molecule of a tank of oxygen gas at 25.0°C ? What is the rms velocity of the molecule?

11. You attend a birthday party and cram an enormous amount of cake and ice cream into your stressed digestive system. You find out that this little snack amounted to over 1500 food Calories. To work this food off, how much equivalent mechanical work would you have to do (in Joules please)?