

Principles of Physics: Problem Set #10
Ideal Gas Model and Thermal Physics

$$PV = nRT \quad ; \quad U = \frac{f}{2} nRT \quad ; \quad v_{rms} = \sqrt{\frac{3k_B T}{m}}$$

$$Q = C\Delta T = mc\Delta T \quad \text{or} \quad Q = mL$$

Due: Friday Nov. 2 in class

Reading assignment:

- for Mon, Ch 7 (pp 135-138) [Kinetic theory & Ideal gas model]
for Wed, Ch 7 (pp 142-144, 148-149) [Thermal energy: Specific and latent heats]
for Fri, Ch 7 (pp 145-154) [Ideal gas processes]

Problem assignment:

(WARNING - The problem naming/numbering scheme in the text is confusing, so ALWAYS double check whether a problem is guided review (**GR**), skill building (**SB**), **Synthesis**, etc.)

CHAPTER 6

GR-2 (pg 154 ... kinetic energy and speed of a gas molecule)

GR-9 (pg 155 ... air in a rising balloon I)

GR-10 (pg 155 ... air in rising balloon II)

GR-13 (pg 155 ... mixing water and ethanol)

GR-18 (pg 155 ... cooling hot water with ice)

SB-2 (pg 155 ... number of molecules: assume "standard" conditions)

SB-7 (pg 155 ... temperature increase of a falling coin)

SB-8 (pg 155 ... energy for a phase change: water to ice)