Name: _____ Section: _____

PHYS 7B - QUIZ 1

I. Circle the correct choice in the parentheses:

1. Thermal expansion is (**a**. *directly* **b**. *inversely*) proportional to (**c**. *temperature* **d**. *the change in temperature*).

2. Steady state in heat flow means (**a**. *the amount of heat flow* **b**. *the amount of heat flow per unit area* **c**. *the amount of heat flow per unit time* **d**. *the amount of heat flow per unit length*) is constant throughout the whole heat conducting material.

3. The rate of heat absorbed by the Earth via radiation from the Sun is proportional to the product of area A and intensity S.
   This area A is the area of (**a**. *cross section of the Earth* **b**. *the Sun's surface* **c**. *the spherical surface with radius equal the radius of Earth's orbit*)
   whereas the intensity S is found by dividing the radiation power of the Sun by the area of (**a**. *cross section of the Earth* **b**. *the Sun's surface* **c**. *the spherical surface with radius equal the radius of Earth's orbit*)

II. A cube of ice (specific heat c_i, latent heat L_i) with mass m_i at temperature $T_i < 0^o C$ is put into a container of steam (specific heat c_s, latent heat L_s) with mass m_s at temperature $T_s > 100^o C$. At the end, we just have water (specific heat c_w) at temperature T_w. Write the heat equation for the system in terms of the given quantities. (You don't need to solve for anything.)

III. Draw the p-V diagram for the following process (mark the values explicitly on the axes):
(i) An ideal gas (starting at volume V_1) expands at constant pressure p_1 until it reaches V_2
(ii) It continues expanding adiabatically to V_3
(iii) The pressure is raised to $p_4 > p_1$ at constant volume V_3
(iv) The gas is compressed isothermally from V_3 to V_1
(v) Finally, its pressure is decreased isochorically to the initial value.
Is the net work done by the gas positive or negative? Label the step(s) in which either $\Delta E = 0$ or $Q = 0$.