*SHOW YOUR WORK.  INCLUDE CORRECT UNITS! Enclose you answers in a box. Remember,*
*you must use correct SI units for temperature(use Kelvin!).*   **Information you will need:**
**Standard pressure is 101.3 kPa.  Standard temperature is 273.15 K. To convert from**
**Celsius to Kelvin:**   K = °C + 273

**Calculate the volume. ASSUME THE TEMPERATURE IS CONSTANT**   $P_1V_1 = P_2V_2$

1.  What is the new volume when a 100.0 cm$^3$ container at 120.0 kPa is expanded until the
pressure is 60.0 kPa?

2. What is the new volume when a 50.0 cm$^3$ container at standard pressure is expanded until
the new pressure is 25.0 kPa?

3. What is the new volume when a 50.0 cm$^3$ container at standard pressure is compressed
until the new pressure is 200.0 kPa?

4. What is the new volume when a 75.0 m$^3$ container at 230.0 kPa is compressed until the
new pressure is 100.0 kPa?

**Calculate the pressure. ASSUME THE TEMPERATURE IS CONSTANT.**  $P_1V_1 = P_2V_2$

1.  What is the new pressure if a 100.0 cm$^3$ container at standard pressure is compressed
until the volume is 50.0 cm$^3$?

2.  What is the new pressure if a 10.0 cm$^3$ container at 150.0 kPa is expanded until the
volume is 50.0 cm$^3$?

3.  What is the new pressure if a 20.0 cm$^3$ container at 150.0 kPa is compressed until the
volume is 3.00 cm$^3$?

**Short Answer (Remember P = F/A)**

1.  You have been accepted into a boat building competition.  You get to pick between two boat plans.  Boat A's plans has the dimensions of 10m wide and 85m long and exerts 2200Pa of pressure.  Boat B's plans has the dimensions of 3m wide and 173m long and exerts 3100Pa of pressure.  In order for the boat to float, the force applied to the water must not exceed $2.0 \times 10^6$N.  Would you pick Plan A or Plan B?

2.  If you are standing on one foot and then put both feet down, you have _____ the force on the ground.

3.  If you are standing on both feet and then stand on one foot, you have _____ the pressure on the ground.

4.  A unit of pressure is called a

5.  A raft is floating on the water.  The bottom of the raft takes up an area of 22m$^2$.  It exerts a force of 847N onto the water.  How much pressure did the raft push on the water?

6.  A jack hammer exerts 6000 Pa of pressure onto the concrete.  The tip only covers an area of 0.04m$^2$.  How much force does the jack hammer apply to the concrete?

7.  The mass per unit volume of a substance is its