Conceptual Physics Pressure Homework Name: _____

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?

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Calculate the pressure at a certain depth in fluid.

1. A boy is swimming at a depth of 2.5 meters below the surface of the water what is the absolute pressure he is feeling?

2. A piece of wood is submerged to 3 meters beneath the surface of a salt water pond. What is the pressure being felt from the water above at that point.

3. An object is put 18 m below the surface of the ocean, what is the absolute pressure at that point?

Calculate the missing piece using $A_1V_1=A_2V_2$

1. Water flows through a pipe that goes from a narrow end ($18cm^2$) to a wide end ($26cm^2$). If the water is moving at 4 m/s in the wide end, what was its velocity in the narrow end?

2. Water flows through a pipe that goes from a wide end ($8cm^2$) to a narrow end ($5cm^2$). If the water is moving at 8 m/s in the narrow end, what was its velocity in the wide end?

3. Water flows through a pipe that goes from a narrow end ($18cm^2$) to a wide end (??). If the water is moving at 4 m/s in the wide end and 12 m/s in the narrow end, what was the area of the wide end?