

Solve the following problems. Write the numerical answer on the blank space provided. Please show your work.

1. A reversible compression is carried out of a gas in an initial volume of 6 L and pressure of 4 atm at 500 K. The gas is compressed to a volume of 2 L. Calculate the work of compression.
  - A. Determine the number of moles of gas (2 points).

Answer \_\_\_\_\_

- B. Calculate the reversible work of compression (2 points).

Answer \_\_\_\_\_

2. Compare the work of compression in question 1 with the work required in a single step irreversible compression.
  - A. Determine the required external pressure to compress the gas from 6 L to 2 L (2 points).

Answer \_\_\_\_\_

- B. Calculate the work of compression. (2 points)

Answer \_\_\_\_\_

3. The molar heat capacity of a polyatomic ideal gas is  $C_{V,m} = 3R$ . What is the molar heat capacity at constant pressure (2 points)?

Answer \_\_\_\_\_