A 3.0 L container contains 4.5 mol of gas which is at a temperature of -125°C. What is the pressure of gas in the container?

Given:

Volume of the gas container: $V = 3.0\ L = 0.003\ m^3$

Number of moles of gas: $n = 4.5\ mol$

Temperature of gas: $T = -125^{\circ}C = 148\ K$

Determine: Pressure of gas: P

Use formula:

$PV = nRT$ ----------(1)

R is the gas constant and has a value of 8.314 J / mol

Rearranging (1) and substituting for V, n, R and T in (1):

$P = nRT / V = (4.5 \times 8.314 \times 148) / 0.003 = 1800\ kPa$