Task. A cylinder of gas is compressed by a piston from an initial volume of $V_0 = 125$ liters to a final volume of $V_1 = 90$ liters. The compression occurs at constant pressure p, and the work done on the gas by the piston is $A = 104$ joules. What is the gas pressure during the compression? (1 liter $= 10^{-3}$ meters^3)

Solution. The work done for the compression of gas from volume V_0 to volume V_1 undeer constant pressure p is given by the formula:

$$A = p(V_0 - V_1),$$

whence

$$p = \frac{A}{V_0 - V_1}.$$

Substituting values we obtain

$$p = \frac{A}{V_0 - V_1} = \frac{104}{(125 - 90) * 10^{-3}} = \frac{104 * 10^3}{35} = 2971.4 \text{ Pa}.$$

Answer. $p = 2971.4$ Pa.