Exercise 2 to section 3.8[1]

Using the barometric formula derived in exercise 1 to section 3.8, calculate the air pressure at 8 km above the Earth surface considering isothermal air at the (mean) temperature of $0\,^{\circ}\mathrm{C}$ and the mean molar mass of 29 g/mol. The pressure at the surface: 100 kPa. Compare the result with available (atmospheric, meteorological) data.

Answer. The integrated formula:

$$P(h) = P(0) \exp(-Mgh/RT).$$

Result: 36.71 kPa.

[1]Based on I. Samohýl: Irreversible Thermodynamics. Prague: University of Chemical Technology, 1998 (*in Czech*).