



$$(1) \quad v = \sqrt{\frac{\gamma R T}{M}} = \sqrt{\frac{1,4 \cdot 8,31 \cdot 298}{28,9 \cdot 10^{-3}}} = 347 \text{ m/s}$$

$$(2) \quad v = \sqrt{\frac{J}{\rho}} = \sqrt{\frac{2 \cdot 10^{11}}{7,8 \cdot 10^3}} = 5,1 \cdot 10^3 \text{ m/s}$$

$$(3) \quad v = \sqrt{\frac{B}{\rho}} = \sqrt{\frac{0,22 \cdot 10^{10}}{10^3}} = 1,5 \cdot 10^3 \text{ m/s}$$

$$(4) \quad v_1 = \sqrt{\frac{\gamma R T_1}{M}} \quad v_2 = \sqrt{\frac{\gamma R T_2}{M}}$$

$$\frac{v_2^2}{v_1^2} = \frac{T_2}{T_1} \Rightarrow v_2 = \sqrt{\frac{T_2}{T_1}} \cdot v_1 = \sqrt{\frac{273}{303}} \cdot 400 = 380 \text{ m/s}$$

$$(5) \quad \beta = 10 \log \frac{I}{I_0} = 10 \log \frac{2 \cdot 10^{-3}}{10^{-12}} = 93 \text{ dB}$$

$$(6) \quad I = I_0 \cdot 10^{\beta/10} = 10^{-12} \cdot 10^4 = 10^{-8} \text{ W/m}^2$$

$$(7) \quad I = I_0 \cdot 10^{\beta/10} = 10^{-12} \cdot 10^{32/10} = 10^{-12} \cdot 10^{3,2} = 1,6 \cdot 10^{-9} \text{ W/m}^2$$

$$(8) \quad a) \quad v = \lambda \cdot \nu \Rightarrow \lambda = \frac{v}{\nu} = \frac{340}{2000} = 0,17 \text{ m}$$

$$b) \quad I = I_0 \cdot 10^{\beta/10} = 10^{-12} \cdot 10^9 = 10^{-3} \text{ W/m}^2$$