Exo 7

1/

a/ $R = \sqrt{\frac{P_0}{4\pi I_0}}$ ($P_0 = I_0 = 10^{-12}$ ... sans les unités) $R = \sqrt{\frac{1}{4\pi}}$

$I = \frac{W}{S} = \frac{P}{S}$ $R \approx 28{,}2$ cm

b/ i) $\Delta T \approx 1{,}475$ ii) $I \approx 3{,}18 \cdot 10^{-4}\ W.m^{-2}$ et $N_1 \approx 85{,}0$ dB

c/ i) $I = 4 \cdot 10^{-5}\ W.m^{-2}$ ii) $N_2 \approx 76{,}0$ dB

iii) $\frac{I}{I_0} = \frac{p^2}{p_0^2}$ $p = p_0 \sqrt{\frac{I}{I_0}}$ $p \approx 0{,}126$ Pa (ou) $p = p_0 \cdot 10^{\frac{90}{20}N}$

d/ i/ $N = 20 \log \frac{P_s}{P_{s0}} = 20 \log \frac{6{,}3 \cdot 10^2}{2 \cdot 10^{-5}} \Rightarrow N = 70$ dB

ii/ $N = 10 \log \frac{I}{I_0} \Rightarrow \frac{N}{10} = \log \frac{I}{I_0} \Rightarrow I = I_0 \cdot 10^{N/10} = 10^{-12} \cdot 10^7 \Rightarrow I = 10^{-5}\ W.m^{-2}$