

40.5.

$$\gamma_1 = 10^{-12} \frac{\text{W}}{\text{m}^2}$$

$$\gamma_2 = 10^{-7} \frac{\text{W}}{\text{m}^2}$$

$$\Delta \Lambda = ?$$

$$\Lambda = \log\left(\frac{\gamma}{\gamma_0}\right)$$

$$\Lambda_1 = \log\left(\frac{\gamma_1}{\gamma_0}\right) \quad \wedge \quad \Lambda_2 = \log\left(\frac{\gamma_2}{\gamma_0}\right)$$

$$\Delta \Lambda = \Lambda_2 - \Lambda_1$$

$$\Delta \Lambda = \log\left(\frac{\gamma_2}{\gamma_0}\right) - \log\left(\frac{\gamma_1}{\gamma_0}\right) = \log\left(\frac{\frac{\gamma_2}{\gamma_0}}{\frac{\gamma_1}{\gamma_0}}\right)$$
$$= \log\left(\frac{\gamma_2}{\gamma_1}\right)$$

$$\Delta \Lambda = \log\left(\frac{10^{-7} \frac{\text{W}}{\text{m}^2}}{10^{-12} \frac{\text{W}}{\text{m}^2}}\right) = \log 10^5$$

$$10^{\Delta \Lambda} = 10^5 \Rightarrow \Delta \Lambda = 5 \text{ B}$$