Hint - Homework 1

Sensitivity is the minimum input power necessary to achieve a suitable energy per bit to noise power spectral density ratio at the output of the receiver $\frac{E_b}{N_0}$. It is determined by the thermal noise power N_t, receiver noise figure N_f and the user rate R_{user}, which is assumed to be equal to the noise bandwidth.

$$\text{RBS}_{\text{sens}} = N_t + N_f + 10\log\left(R_{\text{user}}\right) + \frac{E_b}{N_0}. \tag{1}$$