1. Make y the subject of the formula

$$E = P\left(1 - e^{(y-1)}\right)$$

2. If the amplitude ratio, N in decibels, of an electrical system is given by the formula

$$N = 10\log\left(\frac{P_0}{P_i}\right)$$

and the power is given by

$$P = \left(\frac{V^2}{R}\right)$$

Show that for matched input & output resistances the output V_o is related to the input voltage Vi by:

$$V_o = V_i 10^{\left(\frac{N}{20}\right)}$$

If N is increased by 6dB, show that the output voltage is approximately doubled for the same input.