Homework 4, February 18, 2013

1. Design a inverting amplifier with a gain -10 and a input resistance of $100\,\mathrm{k}\Omega$.
2. Assume $T = 293\,\mathrm{K}$, and amplifier $e_{na} = 10\,\mathrm{nV}/\sqrt{\mathrm{Hz}}$, computing the output noise power spectrum.
3. If the input is a sinusoidal signal with amplitude $1\,\mu\mathrm{V}$, what is the SNR at the output in a $1\,\mathrm{kHz}$ bandpass? And in a $40\,\mathrm{Hz}$ bandpass.
4. If the source has output resistance $1\,\mathrm{M}\Omega$ (consider its noise), which amplfier gain will maximize the output SNR?