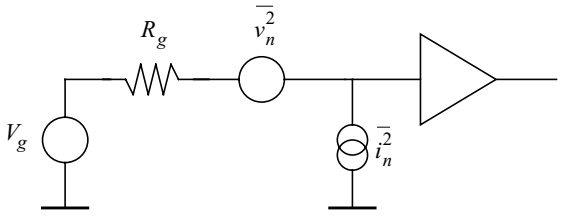
Problems for exercise 4 (Noise):

1. Problem 10.6 (solved by the teacher)

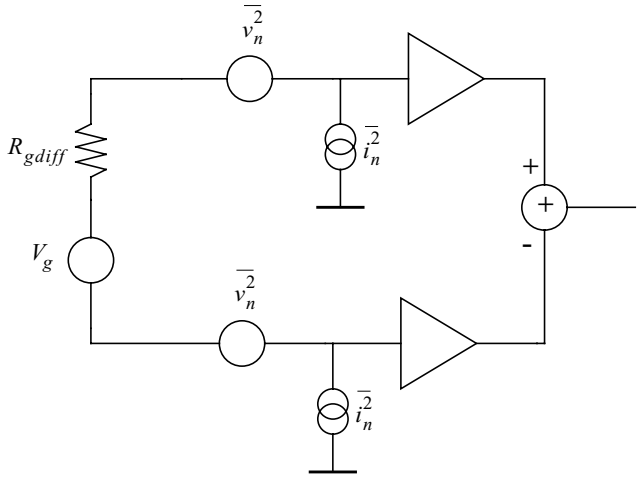
2. Problem 10.9
   Hint: in (b) a lower frequency limit must be assumed (eg. 1mHz) for the 1/f noise to get a finite result. The problem can then be solved by integration.

3. Problem 10.11 (solved by the teacher)

4. Problem 10.12
   Hints:
   Use the trick on page 257 and compare the short-circuit currents from the different noise sources at the input of the amplifier (which is assumed to be a short circuit). (This makes the calculations shorter and is correct since the noise factor is defined as a ratio, where all terms are scaled equal when the amplifier input impedance is changed from zero to a finite value, for details see the book.)
   Start by calculating the noise factor for the single ended cas, see figure:



   The calculate the noise factor for the more complicated differential case:



   Remember that the v_n-sources and R_{gdiff} generates noise at both the amplifier inputs, which furthermore is fully correlated!
   At which value of R_{gdiff} is the noise factor the same as in the single-ended case?