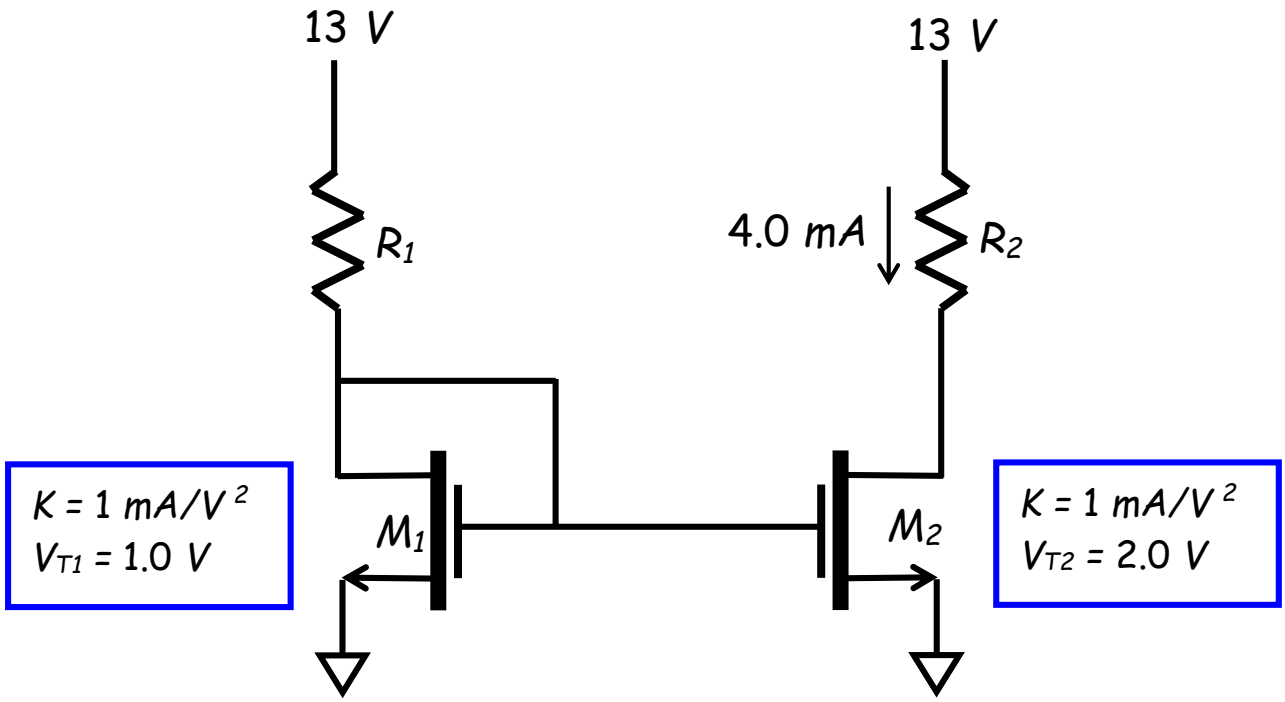
Class Test – 2
(based on topics covered in Lect-5 to Lect-10)
Date: 10.09.2015
Time: 40 minutes

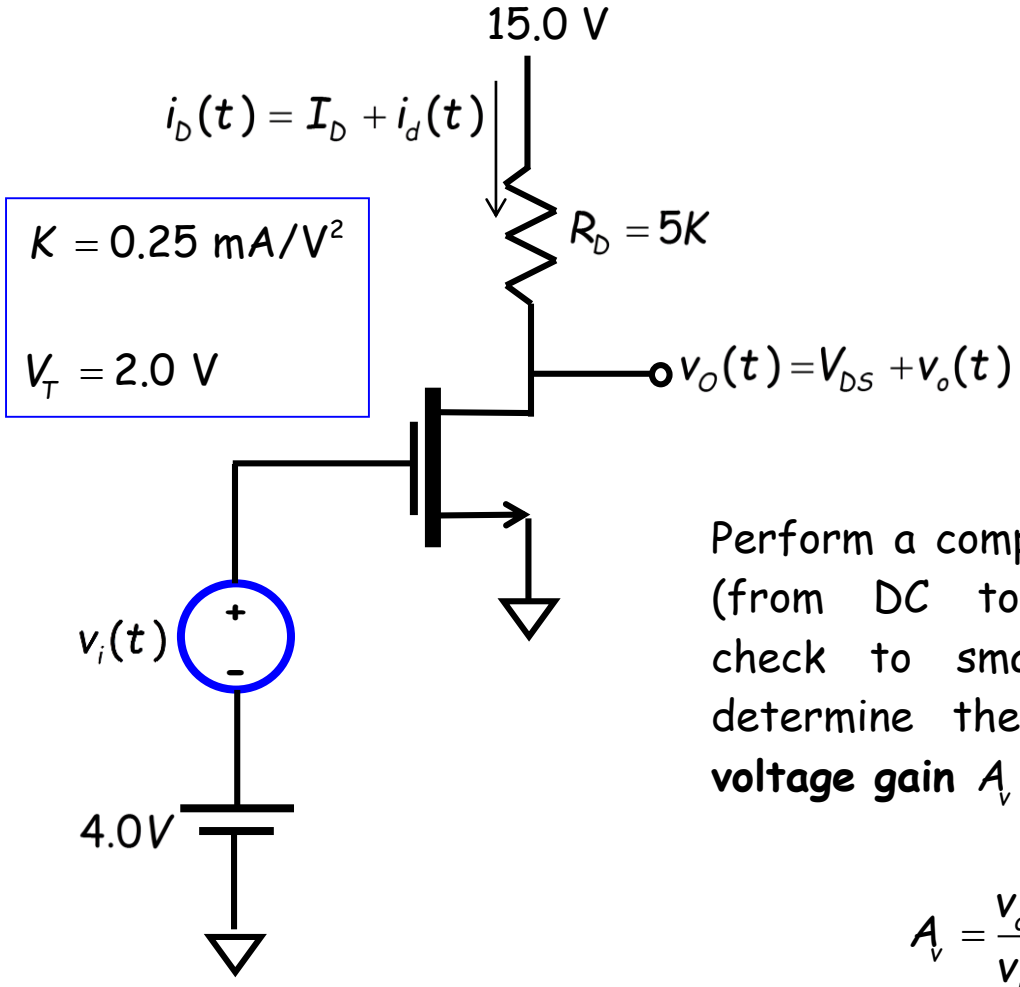
Q1: In the circuit below, M_1 and M_2 are **not** identical. The resistor R_2 has been selected such that M_2 is in saturation.

a) **Determine R_1** (note I said R_1 !) so that the **drain current** of M_2 (note I said M_2 !) **is 4.0 mA**.

b) What is the **largest** possible value of resistor R_2 so that M_2 remains in **saturation?**



Q2: Let's consider the following **NMOS Amplifier**:



Perform a complete analysis (from DC to assumption check to small-signal) to determine the small-signal **voltage gain** A_v:

$$A_v = \frac{v_o(t)}{v_i(t)}$$