

Desk Copy

ECE 300
Spring Semester, 2006
Take Home Portion of Test #2

wlg:
Due: February 28, 2006

Name wlg
Print (last, first)

The work you submit for this problem is to be done on your own. You are not to get help from anyone. This problem will count 10% of your grade for Test 2.

I confirm that I did not receive help from anyone in working this problem.

Signature

You are given the op amp circuit of Figure 1.

- (a) Use analytical methods to determine the current i_o .
- (b) Use PSpice to simulate the circuit and verify your answer for i_o . Use the LM741 op amp of PSpice. Use $V_{CC+} = 12\text{ V}$ and $V_{CC-} = -12\text{ volts}$ for the power supplies in the simulation. Use the place/off-page connector feature to put-in the power supplies. Submit your PSpice simulation diagram with your work.

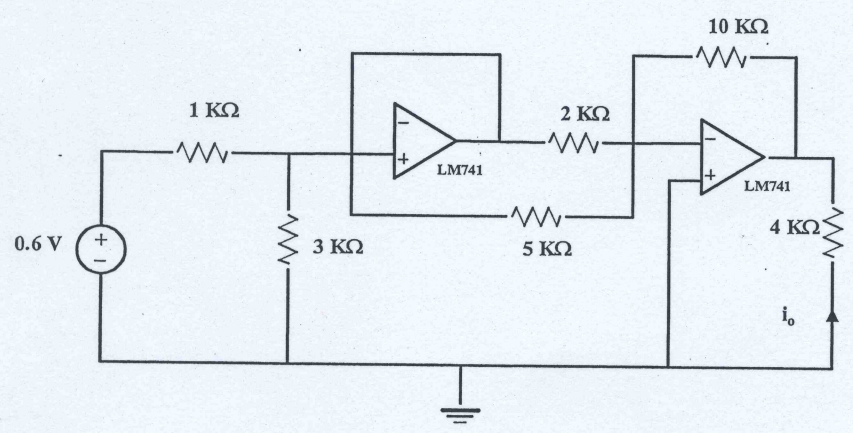
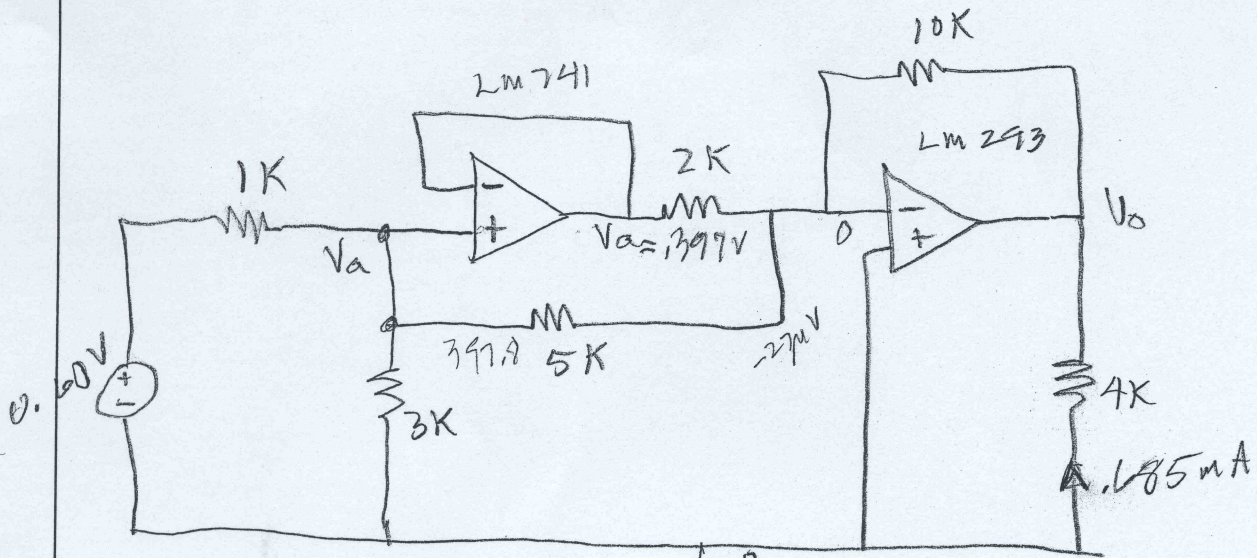


Figure 1: Op amp circuit for the given problem.

Test 2

Outside Problem

5.58



$$\frac{V_a - 15}{1K} + \frac{V_a}{3K} + \frac{V_a}{5K} = 0$$

$$15V_a - 9 + 5V_a + 3V_a = 0$$

$$23V_a = 9$$

$$V_a = 0.3913 \text{ V} \quad \checkmark$$

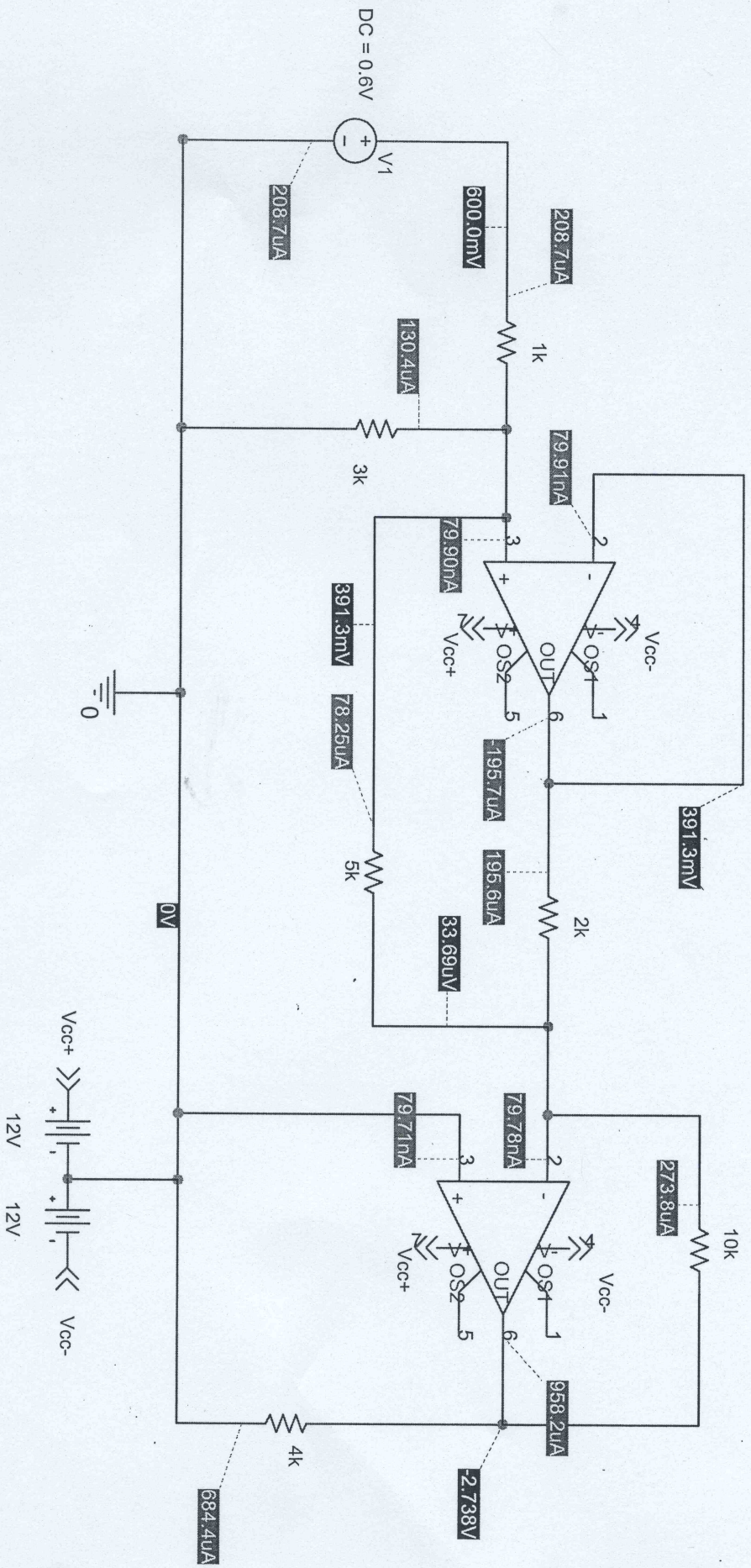
$$\frac{0 - V_a}{2K} + \frac{0 - V_a}{5K} + \frac{0 - V_o}{10K} = 0$$

$$-5V_a - 2V_a = V_o$$

$$V_o = -7 \times 0.3913 = -2.739 \text{ V}$$

get this using LM 293 as above
using LM 741 gives

$$I_o = \frac{2.739}{4K} = 0.685 \text{ mA}$$



Ps spice Circuit for Test 2 Take Home Problem: Spring, 2006