

ECE 3050 Analog Electronics Quiz 11

November 4, 2009

Professor Leach

Name _____

Instructions. Print your name in the space above. Place a box around your answers. Points will be subtracted if you do not express each numerical answer as a decimal number and if you do not put a box around answers. **Honor Code Statement:** *I have neither given nor received help on this quiz.* Initials _____

1 of 2. Given $V_B = 2.6\text{ V}$, $V_{SAT} = 12\text{ V}$, $R_1 = 4\text{ k}\Omega$, and $R_F = 33\text{ k}\Omega$.

(a) Construct the plot of v_O versus v_I .

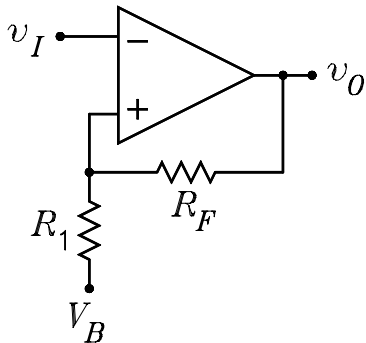
$$V_A = -V_{SAT} \times \frac{R_1}{R_1 + R_F} + V_B \times \frac{R_F}{R_1 + R_F} = 3.62\text{ V}$$

$$V_B = +V_{SAT} \times \frac{R_1}{R_1 + R_F} + V_B \times \frac{R_F}{R_1 + R_F} = 1.02\text{ V}$$

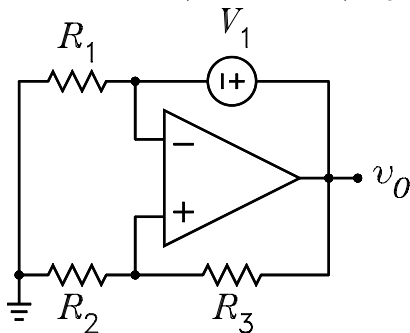
For the graph, see Fig. 1.37 at

<http://users.ece.gatech.edu/~mleach/ece3050/sp04/OpAmps01.pdf>

(b) Sketch the graph of v_O versus t for $v_I(t) = 6 \sin(\omega t)$.



2 of 2. For $R_1 = 2\text{ k}\Omega$, $R_2 = 6\text{ k}\Omega$, $R_3 = 4\text{ k}\Omega$, and $V_1 = 6\text{ V}$, solve for v_O .



$$v_O - V_1 = v_O \frac{R_2}{R_2 + R_3} \implies v_O = V_1 \frac{R_3}{R_2 + R_3} = 2.4\text{ V}$$