EECS 40/42/100, Spring 2007
Prof. Chang-Hasnain

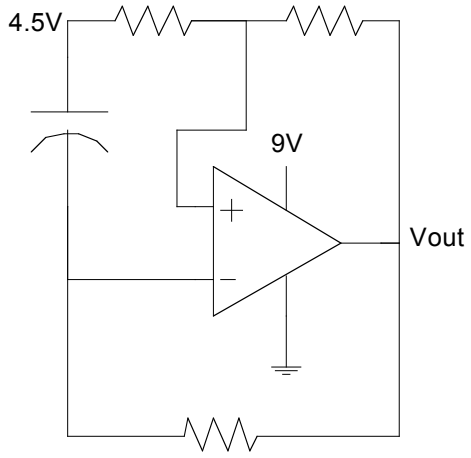
Homework #8

Due at 6 pm in 240 Cory on Wednesday, 03/21/07
Total Points: 100

- Put (1) your name and (2) **discussion section number** on your homework.
- You need to put down all the derivation steps to obtain full credits of the problems. Numerical answers alone will at best receive low percentage partial credits.
- No late submission will be accepted expect those with prior approval from Prof. Chang-Hasnain.
- *Note: Power gain is defined as the ratio between power to a load and power from an input source.

1. Hambley, P14.2
2. Hambley, P14.5
3. Hambley, P14.8
4. Hambley, P14.10
5. Hambley, P14.13
6. Hambley, P14.17
7. Hambley, P14.20
8. Hambley, P14.22
9. Hambley, P14.29

10. (EE 40 only) Consider the following circuit with **positive** feedback, with all resistors 1k, and the capacitor 1uF.



a) Suppose the capacitor is initially uncharged. What is V_{out} (0)?
b) Assuming this V_{out} does not change for some period of time (call the first time at which is changes t_1), Derive expressions for $V_+(t)$ and $V_-(t)$ for $0<t<t_1$.
c) What is the value of t_1? (Hint: How does V_{out} depend on V_+ and V_-?)
d) Now that V_{out} has changed, Derive new expressions for $V_+(t)$ and $V_-(t)$ for $t_1<t<t_2$., where t_2 is the next time V_{out} changes.
e) What is the value of t_2?
f) Plot $V_+(t)$, $V_-(t)$, and $V_{out}(t)$ for t ranging from 0 to 5ms.
g) What function does this circuit perform?