a) For the CMOS op-amp in problem C.8, find the slew-rate limitation SR.

b) Prepare a simulation file c9.cir assuming the op-amp is used as a unity-gain amplifier with feedback returned from the output to the (-) input. Use the netlist opamp1.spice extracted from layout.

   - Use a .dc sweep over $v_I$ to plot $v_O(v_I)$ characteristic of the unity-gain feedback amplifier for $0V \leq v_I \leq V_{DD} = 10V$. Find the available signal swing (the range of $v_I$ where $v_O = v_I$).

   - If the DC input is $V_I = 5V$, use an .ac simulation to plot the magnitude response $20 \log |v_o/v_i|$. Record the low-frequency gain, the frequency of the peaking in the magnitude response, and the bandwidth frequency. Turn in a plot of the magnitude response. Compare the bandwidth to the theoretical prediction that follows from part (a).

   - Use a pulse generator for the input $v_i$ to verify the slew-rate limitation found in (a). Turn in a plot of the output voltage $v_o(t)$ transient response.

You can use the following Spice netlist lines for the input and the simulation tasks (note that the input pulse generator is from 4V to 6V, with rise and fall times equal to 10ns, pulse width equal to 1µs and period equal to 2µs):

```spice
Vin p 0 dc 5 ac 1 pulse 4 6 0 10n 10n 1u 2u
.dc Vin 0 10 0.1
.tran 1n 4u
```