Project 1   ECE1371S

1) **Feedback**

Consider the feedback circuits shown below in fig 1(a) and 1(b) and using the simple opamp model shown in 1(c).

(a)   (b)

(c)
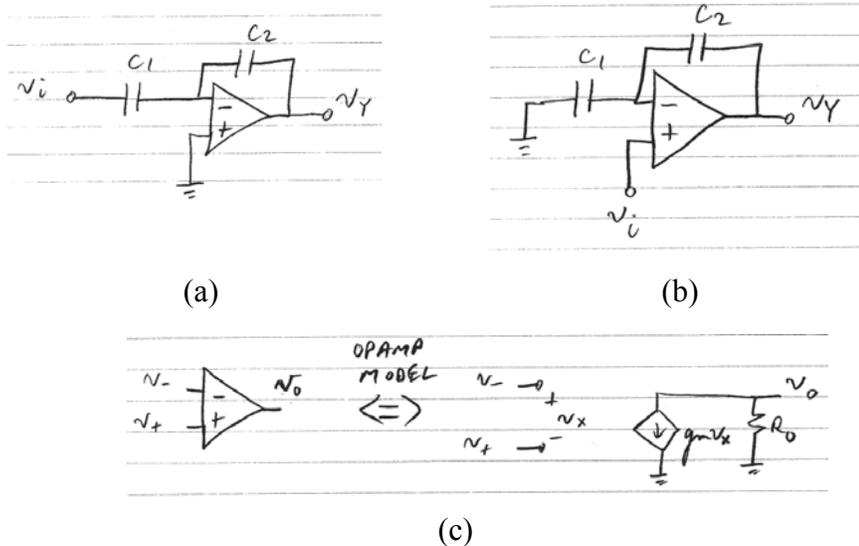
Figure 1

Use feedback analysis from Sedra/Smith and replace the opamp by its model in fig. 1(c). (note that there is a feedforward term in fig. 1(a) so be careful to deal with it)

a) Find $A(s)$ and $\beta(s)$ for both the circuits in 1(a) and 1(b) using the 2-port approach of Sedra/Smith.

b) Defining the 2-port loop gain as $L_2(s) \equiv A(s)\beta(s)$, find $L_2(s)$ for both circuits in 1(a) and 1(b).

c) Find the pole of the system for both cases when $g_m R_0 \gg 1$.

d) Using the different $L_2(s)$ for the 2 cases, find example values where the phase margin is significantly different in the 2 cases (use matlab here).