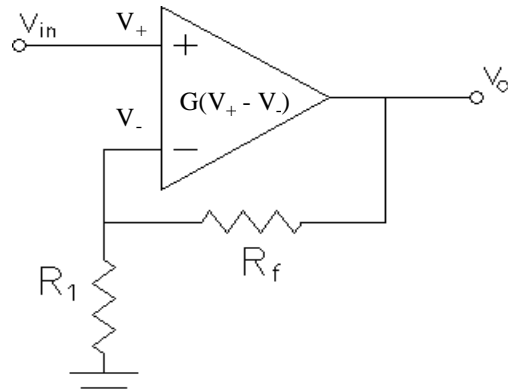


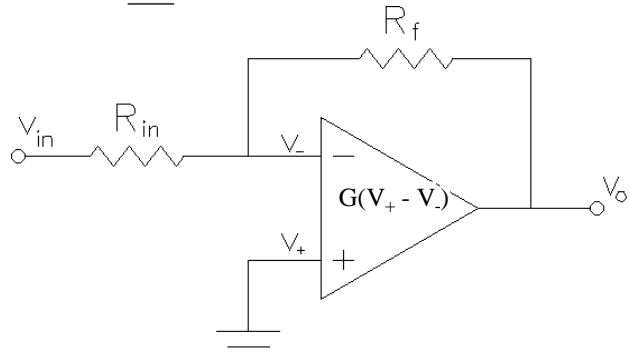
ECE 1250 homework # 12

a

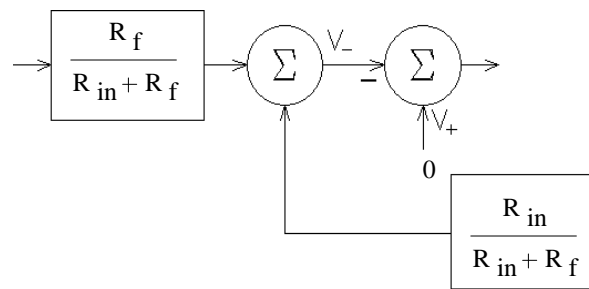
1. a) Draw a standard feedback loop for the noninverting op amp amplifier. Assume no current flows into the op-amp inputs.
- b) Use the standard feedback loop expression to find the transfer function for this amplifier.
- c) Show that this expression simplifies to the standard gain expression for this amplifier if G is very large.



2. a) Draw a standard feedback loop for the inverting op amp amplifier. There also will be an extra block before the loop. This amplifier is trickier than the noninverting amp, so I've done part of the loop for you. You will have to combine the summation circles together into one and complete the loop. Assume no current flows into the op-amp inputs.



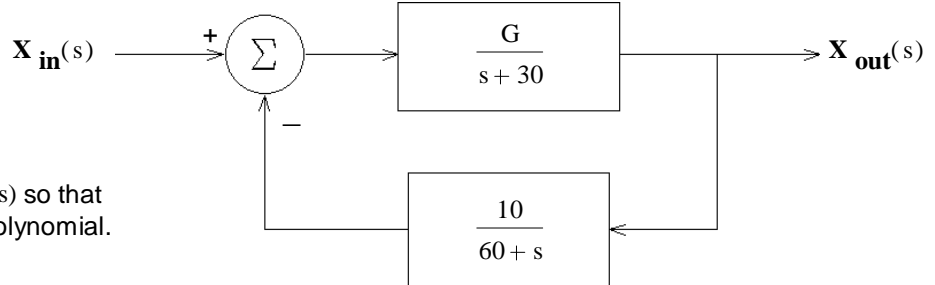
- b) Combine the leading block with the standard feedback loop expression to find the transfer function for this amplifier.
- c) Show that this expression simplifies to the standard gain expression for this amplifier if G is very large.



3. A feedback system is shown in the figure. What is the transfer function of the whole system, with feedback.

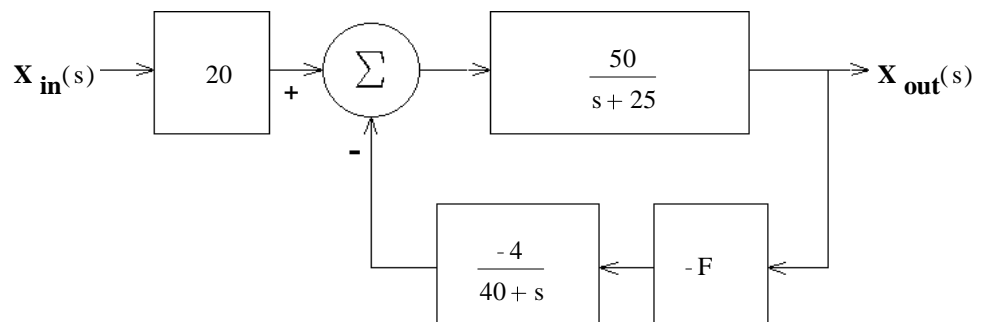
$$H(s) = \frac{X_{out}(s)}{X_{in}(s)} = ?$$

Simplify your expression for $H(s)$ so that the denominator is a simple polynomial.



4. A feedback system is shown in the figure. What is the transfer function of the whole system, with feedback.

$$H(s) = ?$$



Answers

1 & 2 see text

$$3. \frac{G \cdot (s + 60)}{s^2 + 90 \cdot s + 1800 + G \cdot 10}$$

$$4. 1000 \cdot \frac{s + 40}{s^2 + 65 \cdot s + 1000 + 200 \cdot F}$$