

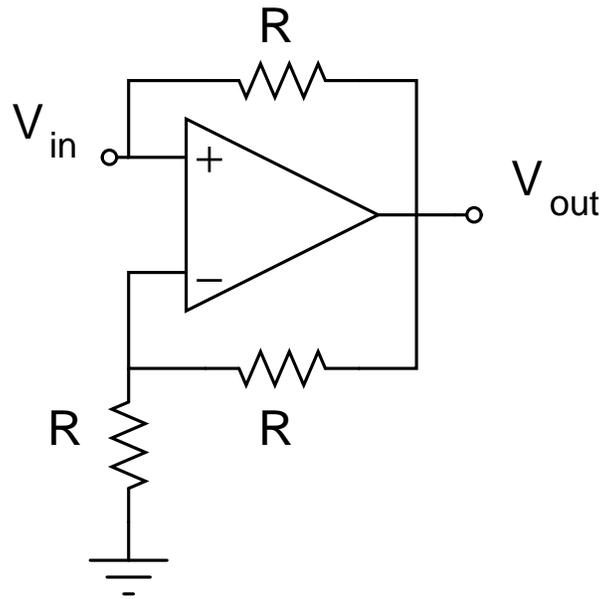
# PHYSICS 3150

Total: 20 marks

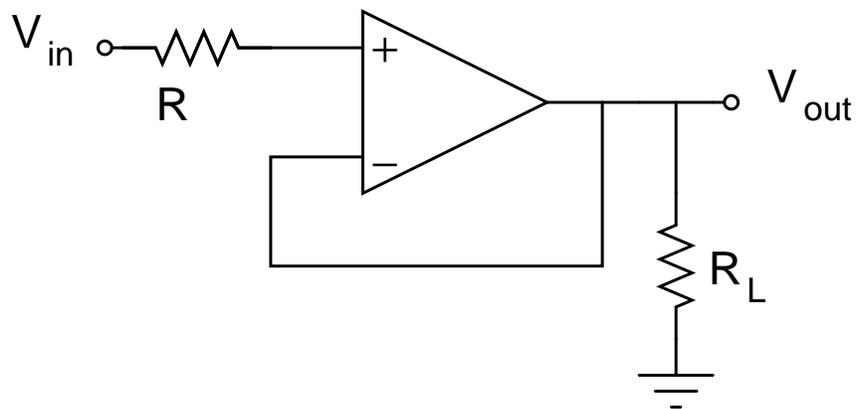
# Problem Set 1

due February 1, 2005

1. (5 marks) What is the closed-loop gain,  $A_V$ , and the input impedance,  $R_{in}$ , of the following circuit?



2. (5 marks) Design a current-to-voltage converter for a transducer which can produce a current as large as 5 mA.
3. (5 marks) In the following circuit  $R=50\text{ k}\Omega$ ,  $R_L=200\text{ }\Omega$  and  $V_{in}=5+3\cos\omega t$  V. Assuming that the maximum current the op-amp can supply is 25 mA, sketch  $V_{out}$ .



4. (5 marks) What is the closed-loop gain of the following circuit? Is it a filter and, if so, what kind?

