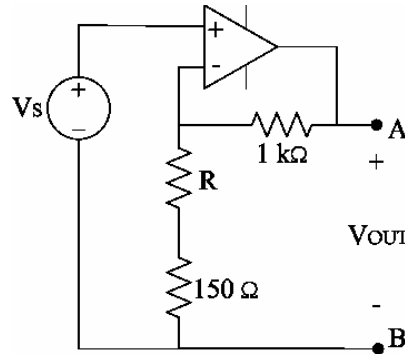*All the normal rules apply: Due next class, work on separate paper, start early, show your work, label everything, specify units, circle answers.*

1. For the following ideal op-amp circuit, find R such that the gain $V_{OUT}/V_S = +5$.


The process outlined in "A-E" below is the standard procedure to solve any Thevenin/Norton Equivalent problem. Apply it to the remainder of this homework for each problem. Remember that each step requires separate calculations. There are no shortcuts.

   A. Find the open circuit voltage V_{OC} across points A and B.

   B. Find the Short-circuit current I_{SC} that flows through a wire connected across terminals A-B.

   C. Determine R_{TH} from your answers in parts A and B.

   D. Draw and label the Thevenin equivalent circuit (voltage source and resistor in series).

   E. Draw and label the Norton equivalent circuit (current source and resistor in parallel).

For the circuits below, use the procedure (and label your steps) to calculate the values for, draw, and label the Thevenin and Norton equivalent circuits using points A and B. Answers should be in terms of the labeled values

   2.
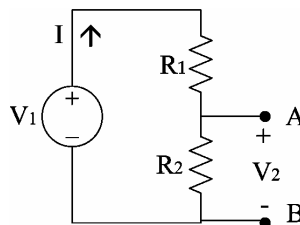
   3.
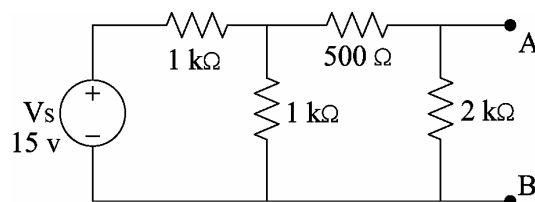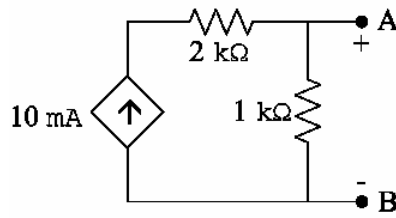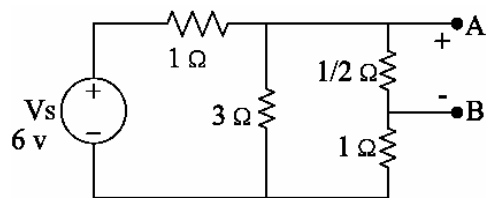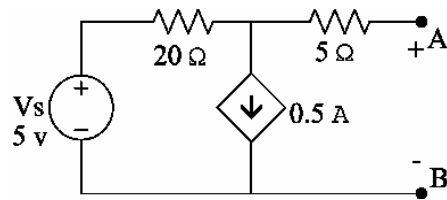
4.

5.

6.   Hint: Label everything and watch your signs closely!

7.