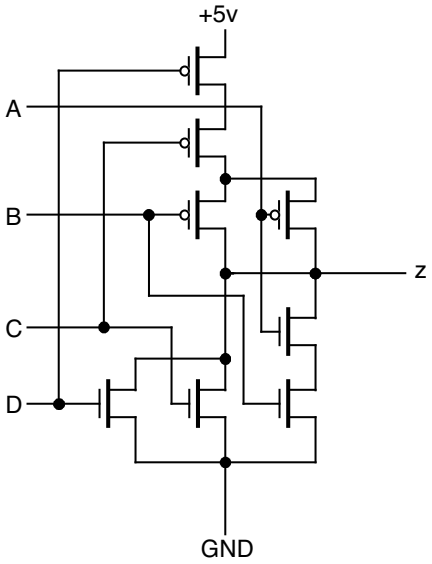
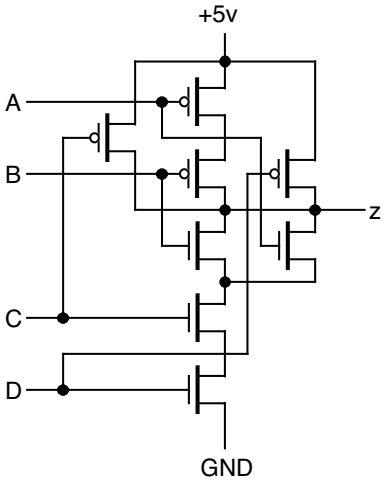
Due: October 30, 2003

1. (20 points) Draw schematics for the following functions using AND, OR and NOT gates. (Do not simplify the formulas.)
   (a) $X(Y + Z)$
   (b) $\overline{X} + \overline{Y}\,\overline{Z}$
   (c) $\overline{X(Y + Z)}$
   (d) $W(X + YZ)$
2. (10 points) Question A.3, page 493, Murdocca & Heuring
3. (10 points) Prove the Consensus Theorem $AB + \overline{A}C + BC = AB + \overline{A}C$ using the postulates and theorems of Boolean algebra (except the Consensus Theorem itself) in Table A-1 (p. 451). *Hint:* use absorption creatively.
4. (40 points) For each CMOS circuit below,
   (a) Provide a truth table for the circuit's function.
   (b) For diagram (a), write down the Sum-of-Products (SOP) Boolean formula for the truth table. For diagram (b), wrtie down the Product-of-Sums (POS) Boolean formula.
   (c) Simplify the SOP or POS formula using the postulates and theorems of Boolean Algebra (p. 451). *Show all work.*
   (d) Draw the logic diagram of the simplified formula using AND, OR, NAND, NOR and NOT gates.



(a)



(b)