**Homework #1**

Reading Assignment: Chapters 3-1 through 3-9 of *Digital Systems: Principles and Applications*, 10th edition, by Tocci, Widmer & Moss.

1-1   You can't read the number on a chip, but you think it is either a 7408 or a 7432. What one set of inputs can be used to determine which chip it is? Explain your answer. For these inputs, if the result is high, which chip is it?

1-2   Repeat problem 1-1 if the chip is either a 7400 or a 7486.

1-3   Repeat problem 1-1 if the chip is either a 7432 or a 7486.

1-4   For the circuit shown, determine the Boolean expressions for X and Y, and create a truth table for both.
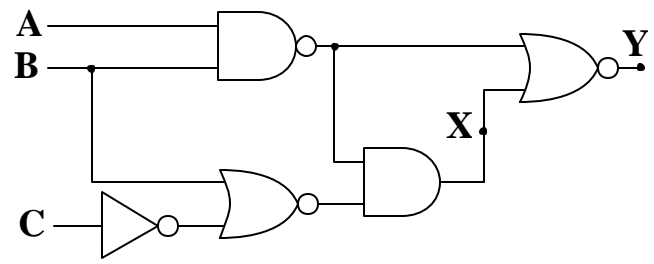
1-5   A bank alarm *A* is high (on) if the vault *V* is open (high), and is also high if an entry door *D* is high (open) while a key *K* is high (removed from its hook). Write the Boolean expression and draw the circuit for *A*.

1-6   Using *Digital Works*, create a circuit as described below. When done, save it as **abc23-assign01.dwm**, where **abc23** is your Geneseo email name. Then, drag it into my inbox (\\files\Inbox\Physics\Pogo).

   a. Create 4 Interactive Inputs, and label them *A*, *B*, *C*, and *D* using a separate text box, with a bold, size 12 font.

   b. Create 2 output LEDs, and label them *Q* and *R*.

   c. Create the circuit such that $Q = \overline{(A+B)}(CD)$, and $R = (B+C)\overline{A}\ \overline{D}$. When done, all wires should be neat and either vertical or horizontal.

   d. Add another text box indicating your name.

   e. On paper (i.e., along with parts 1-1 through 1-6 above), complete a truth table for this circuit:

A	B	C	D	Q	R
0	0	0	0		
0	0	0	1		
0	0	1	0		
0	0	1	1		
0	1	0	0		
0	1	0	1		
0	1	1	0		
etc.	etc.	etc.	etc.	etc.	etc.