Homework 2
Due: Friday, 01/23

From “Fundamentals of Logic Design” by C. Roth, 5th Edition:

2.4 a (assume all variables are high true) 2.7 a (multiply out first)
2.8 b (apply DeMorgan’s Theorem) 2.9 b (first find G and then simplify)
2.10 b (prove by showing Boolean rules handed out in class) 2.11 d (simplify, using Boolean rules)
2.12 f (simplify using Boolean rules handed out in class) 2.13 b (first find F2 and then simplify)
2.15 d (write as product of sums) 2.17 c (simplify w/DeMorg. & Boolean rules)
2.20 (just simplify using Boolean rules) 2.21 c (prove with Boolean rule)

3.7 a (simplify using Boolean rules) b (simplify using Boolean rules)
3.9 (prove with truth table for each side)
3.10 b (first expand exclusive or term then apply Boolean rules)
3.14 a, c
3.15 d (write as MPOS, try to simplify first)
3.18 c, e
3.23 b
3.28 a

Additional Problems:

1. Evaluate with the following expressions for A = F, B = F, C = T and D = T:
   a.) (A+B+C)/(A+C+/D)(A+B+C*/D)  b.) /(A+B)*/(A+/C*D + CD)

2. Find the CSOP for the Z functions below:
   a.)
   \[\begin{array}{ccc}
   ABC & Z \\
   000 & 0 \\
   001 & 1 \\
   010 & 1 \\
   011 & 0 \\
   100 & 1 \\
   101 & 1 \\
   110 & 0 \\
   111 & 1 \\
   \end{array}\]
   b.)
   \[\begin{array}{ccc}
   ABC & Z \\
   000 & 1 \\
   001 & 1 \\
   010 & 1 \\
   011 & 0 \\
   100 & 0 \\
   101 & 1 \\
   110 & 1 \\
   111 & 1 \\
   \end{array}\]
3. Find the CPOS for the Z functions in #2:
   a.) Z =
   b.) Z =

4. Find the MSOP for Z in #2:
   a.) MSOP Z =
   b.) MSOP Z =

5. Find the MPOS for Z in #3:
   a.) MPOS Z =
   b.) MPOS Z =

6. Draw a circuit diagram for the following equation using AND, OR, and NOT gates. Assume that all inputs and outputs are active-high:

   \[ Y = /A \land B \land /C \land D \]