Name: _____

Boolean Algebra Homework

1. Simplify $A + AB$ using identities and laws presented in class and in the book. (You may not use the "covering" theorem, of course.) Hint: Begin by factoring the A out of this expression as if it were a "regular" numeric expression.
2. Explain why the result from the previous exercise makes sense intuitively.
3. Simplify $A(A + B)$.
4. Use a truth table to simplify $A + \bar{A}B$.
5. Explain why the result from the previous exercise makes sense intuitively.
6. Use your result from problem 4 to simplify $XY + \overline{(XY)}B$.
7. Simplify $\bar{A} + AB$. Clearly explain how your answer from Problem 4 applies to this problem.
8. Simplify each of the statements below using boolean laws and identities. Show your work.
   (a) $(A + B)(A + C)(\overline{A} + \overline{B})$
   (b) $F(E + F + G)$
   (c) $AB + \overline{A}B + A\overline{B} + \bar{A}\bar{B}$
   (d) $(A + B)(\overline{A} + \overline{B})$
   (e) $(B + \overline{C} + \overline{A}B)(BC + A\overline{B} + AC)$
   (f) $AB + A\overline{B}$
   (g) $\overline{A}BC + AC$
   (h) $AB + \overline{A}B + BC$
   (i) $\overline{(AB + \overline{A}C + B\overline{C})}$
   (j) $\overline{(A + B + C)}D + AD + B$