Math 2534  Homework 12
Show all work and staple multiple sheets.

Problem 1:
Define a Boolean Algebra as follows:
Let \( B = \{1, 2, 3, 5, 6, 10, 15, 30\} \) be the set of all positive divisors of 30 with operations defined on the set to be as follows: \( \text{LCM}(a, b) = a \oplus b \), and the \( \text{GCD}(a, b) = a \cdot b \)

The negation is defined \( \overline{a} = \frac{30}{a} \)

a) Find the identities for \( \oplus \) and \( \cdot \)
a) Give an example that Idempotent law holds
b) Give an example that DeMorgan’s law holds. \( (a+b) = \overline{a \cdot \overline{b}} \) or \( (a \cdot b) = \overline{a \oplus \overline{b}} \)
c) Find the value for \( b \oplus \overline{b} \) when \( b = 6 \).
What is the value of \( b \cdot \overline{b} \) for any value \( b \) according to the universal bound law of a Boolean Algebra?

Problem 2:
do problems 10, 11, 12, 14, 20 in sec 8.1 on page 448 in your text book.