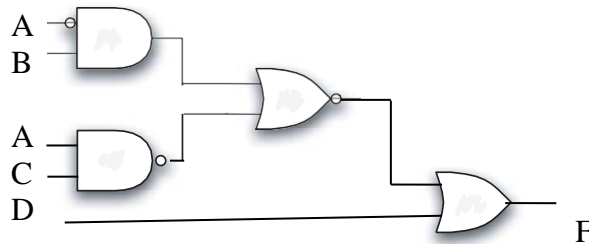


First Name: \_\_\_\_\_ Last Name: \_\_\_\_\_

- Prove by means of truth table that  $(AB)' = A' + B'$
- Circle T (true) or F (false) for each of these Boolean equations.
  - $T$   $F$   $A + 1 = A$
  - $T$   $F$   $A + BC = (A + B)(B + C)$
  - $T$   $F$   $\overline{A} \oplus \overline{B} = A \oplus B$
  - $T$   $F$   $A(BC) = (AB)C$
  - $T$   $F$   $A + B + C = A \cdot B \cdot C$
- Demonstrate by means of truth tables the validity of the following identities
  - DeMorgan's law for three variables:  $(X+Y+Z)' = X'Y'Z'$  and  $(XYZ)' = X' + Y' + Z'$
  - $(X+Y)X = X$
- Using AND and OR gates, draw the logic diagrams for the following Boolean expressions without expanding or simplifying them.
  - $Y = (A'+B')C + B(A+C)$
  - $W = (A+B')(C+D')$
- Write the Boolean expression equivalent to the following logic circuit. Do not simplify! Hint: Each bubble has the same effect as an inverter.



- Write a truth table for

$$F(A, B, C) = \overline{(A + B)}(B + \overline{C})$$

- Find the dual of
  - $F = A'B + B'C' + \overline{D}$
  - $F(A, B, C) = \overline{(A + B)}(B + \overline{C})$
- Find the complement of
  - $F = A'B + B'C' + \overline{D}$
  - $F(A, B, C) = \overline{(A + B)}(B + \overline{C})$