

CSSE 132 – Introduction to Computer Systems
Rose-Hulman Institute of Technology
Computer Science and Software Engineering Department

Logic Handout

1 Postulates:

1. $A = 0$ if $A \neq 1$
 $A = 1$ if $A \neq 0$
2. if $A = 0$ then $\overline{A} = 1$
if $A = 1$ then $\overline{A} = 0$
3. $0 \cdot 0 = 0$
 $1 + 1 = 1$
4. $1 \cdot 1 = 1$
 $0 + 0 = 0$
5. $0 \cdot 1 = 1 \cdot 0 = 0$
 $1 + 0 = 0 + 1 = 1$

2 Theorems:

1. $A + 0 = A$
 $A \cdot 1 = A$
2. $A + 1 = 1$
 $A \cdot 0 = 0$
3. $A + A = A$
 $A \cdot A = A$
4. $\overline{(\overline{A})} = A$
5. $A + \overline{A} = 1$
 $A \cdot \overline{A} = 0$
6. $A + B = B + A$
 $A \cdot B = B \cdot A$
7. $A + (B + C) = (A + B) + C$
 $A \cdot (B \cdot C) = (A \cdot B) \cdot C$
8. $A \cdot B + A \cdot C = A \cdot (B + C)$
 $(A + B) \cdot (A + C) = A + B \cdot C$
9. $A + A \cdot B = A$
 $A \cdot (A + B) = A$
10. $A \cdot B + A \cdot \overline{B} = A$
 $(A + B) \cdot (A + \overline{B}) = A$
11. Demorgan's law:
 $\overline{(A + B)} = \overline{A} \cdot \overline{B}$
 $\overline{(A \cdot B)} = \overline{A} + \overline{B}$