

Thursday Reading Assessment: Chapter 4

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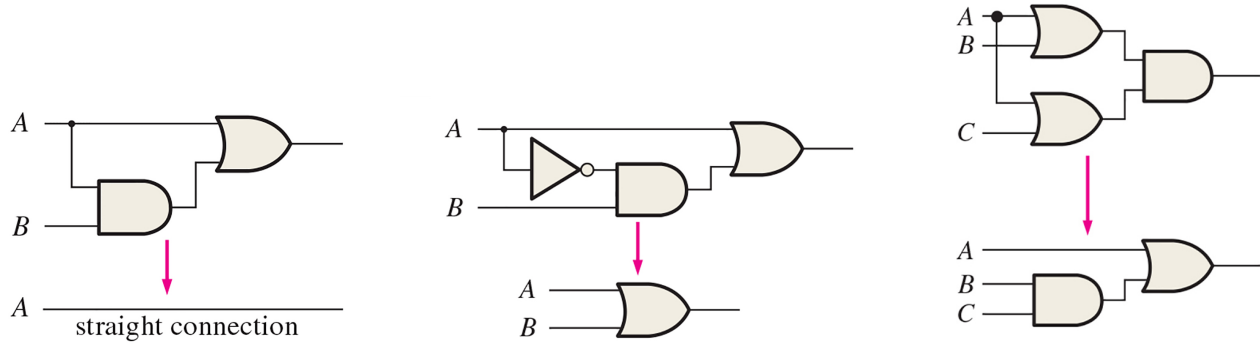


Figure 1: (a) Show that $A + AB = A$. (b) Show that $A + \bar{A}B = A + B$. (c) Show that $(A + B)(A + C) = A + BC$.

1 Logic Circuits and Boolean Algebra

1. Consider the three circuits in Fig. 1. Prove that each reduces to a simpler circuit using a truth table.

2. Consider the following equation:

$$X = \overline{\overline{A + BC} + D(E + \bar{F})} \quad (1)$$

(a) Use DeMorgan's Theorems to reduce this expression. (b) Draw a circuit corresponding to the *unsimplified* expression. (c) Draw a circuit corresponding to the *simplified* expression. (d) How many gates are removed from the design through simplification?