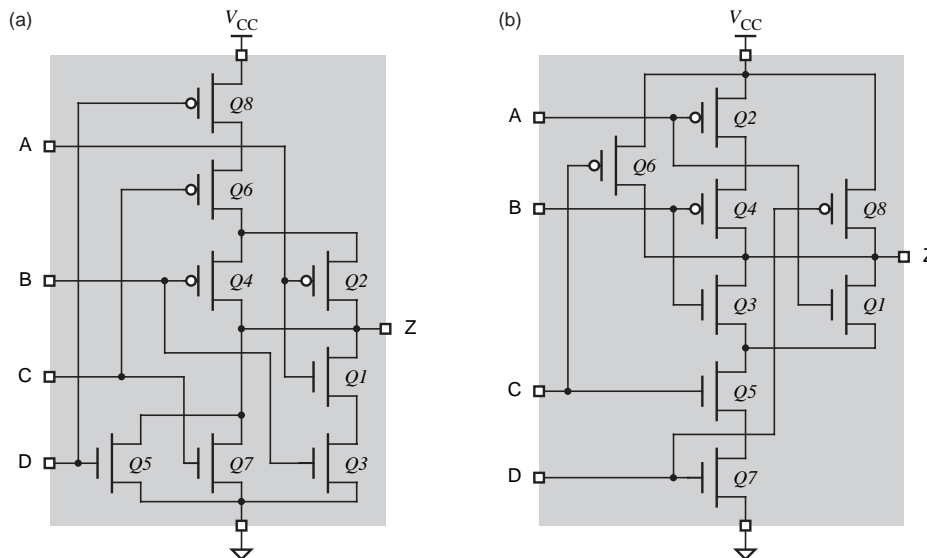


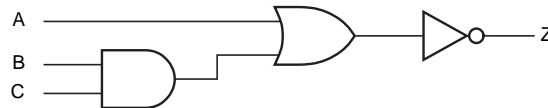
**Homework #1**

Due: Thursday, October 17

- For each of the following negative number representations—signed-magnitude, excess-128, ones' complement, and two's complement—find the 8-bit encoding of  $-37$ .
- (DDPP 2.27) In most cases, the product of two  $n$ -bit two's-complement numbers requires fewer than  $2n$  bits. In fact, there is only one case in which  $2n$  bits are needed. Find it.
- (DDPP 3.16) The circuit in Figure X3.16(b) is a type of CMOS OR-AND-INVERT gate. Write a function table for this circuit in the style of Figure 3-15(b), and a corresponding logic diagram using AND and OR gates and inverters.



- (DDPP 3.60) CMOS circuit design. Design a CMOS circuit that has the functional behavior shown in Figure X3.60. (Hint: Only six transistors are required.)



- (DDPP 3.3) Discuss how a logic buffer amplifier is different from an audio amplifier.