

Question 1: Pondering Truth Tables Answer the following about truth tables.

1.1. A truth table for 3 input variables has how many rows?

1.2. a truth table for 4 input variables has how many rows?

1.3. Write a general expression for the number of rows given n input variables.

Question 2: nMOS Transistors Fill in the blanks.

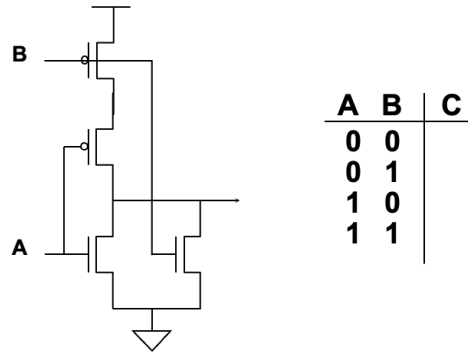
Figure 1: nmos transistor

- 2.1. Acts as a(n) _____ (open/closed) switch when the gate voltage (V_g) is low.
- 2.2. Meaning that current _____ (can/cannot) flow between source and drain.
- 2.3. Acts as a(n) _____ (open/closed) switch when the gate voltage (V_g) is high.
- 2.4. Meaning that current _____ (can/cannot) flow between source and drain.

Question 3: pMOS Transistors Fill in the blanks.

Figure 2: pmos transistor

- 3.1. Acts as a(n) _____ (open/closed) switch when the gate voltage (V_g) is low.
- 3.2. Meaning that current _____ (can/cannot) flow between source and drain.
- 3.3. Acts as a(n) _____ (open/closed) switch when the gate voltage (V_g) is high.
- 3.4. Meaning that current _____ (can/cannot) flow between source and drain.



Question 4: CMOS Practice What function does this gate compute?

Question 5: Composing Gates The truth table for an XOR gate is given below.

A	B	Y = A XOR B
0	0	0
0	1	1
1	0	1
1	1	0

5.1. Assume the output is Y. Write a boolean expression for Y using only AND, OR, and NOT.

5.2. Sketch a gate-level implementation using AND, OR, and inverters.