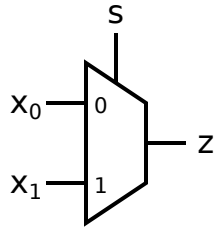
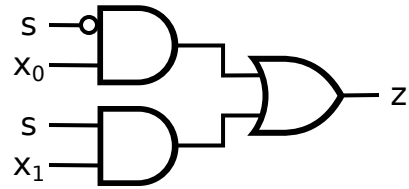


Name: _____ Computing ID: _____

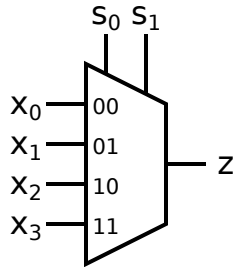
Recall that a 2-input mux



can be built from basic gates:

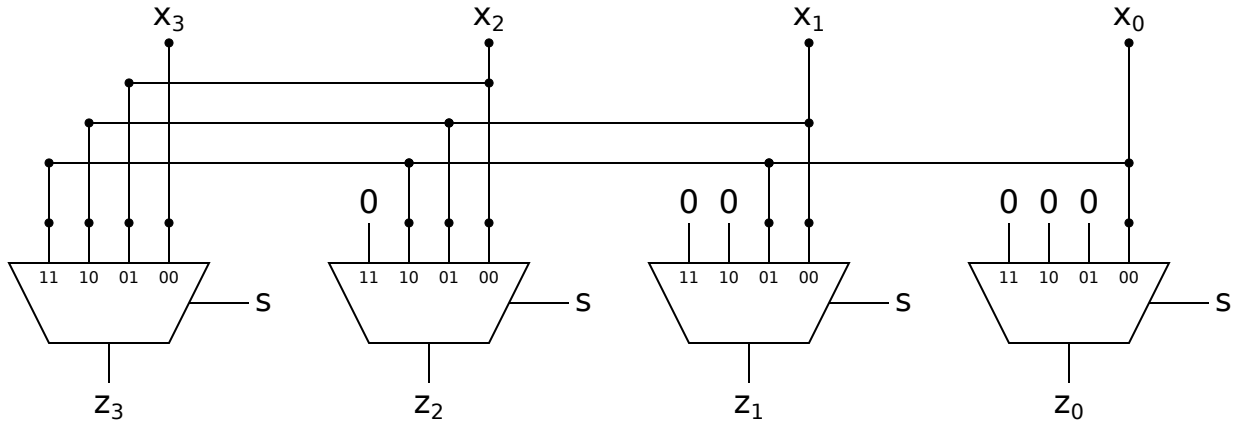


Consider this 4-input mux:



Draw the basic gates needed to build it:

The following circuit implements a 4-bit left-shift, $z = x \ll s$. Dots are used to show where wires join as opposed to crossing over each other without touching.



Complete the following diagram to implement sign-extending right-shift, $z = x \gg s$. Use dots, etc, similarly to the example diagram above.

