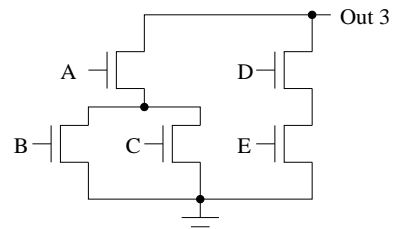
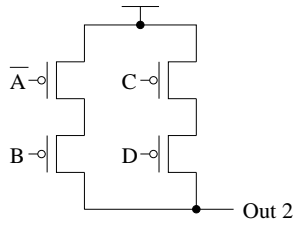
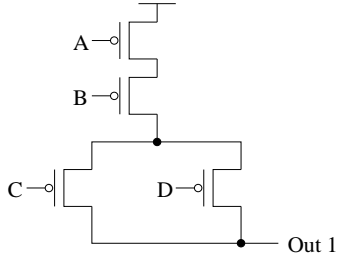


Incomplete Circuits

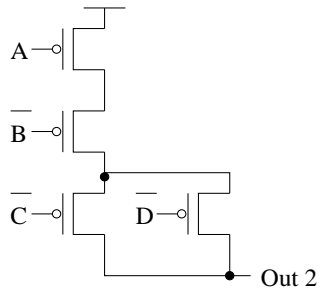
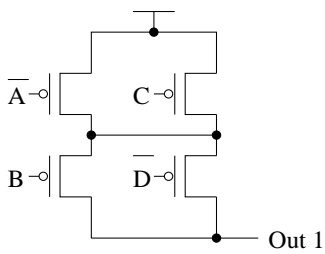
Several incomplete circuits are shown below. Complete each circuit by adding the needed devices so the output is high or low for all combinations of inputs (i.e., no floats or shorts). If the circuit contains NFETs, use only PFETs. If the circuit contains PFETs, use only NFETs. Also, for each circuit, write a boolean expression for when the output is high.



Out₁ = _____

Out₂ = _____

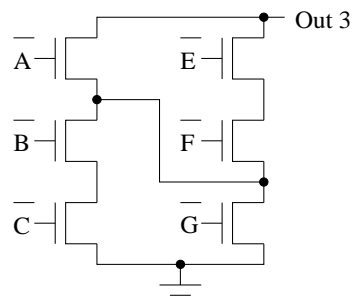
Out₃ = _____

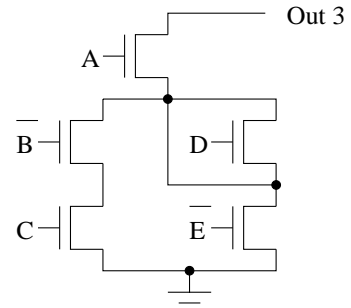
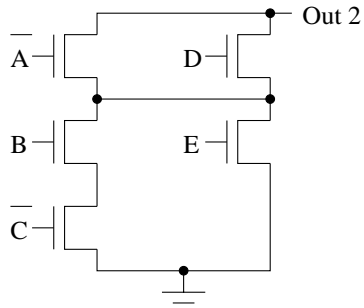
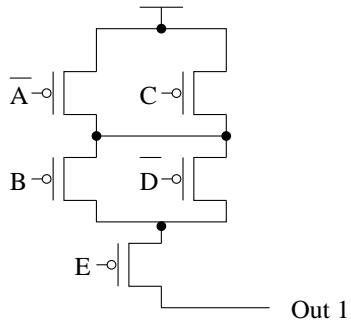


Out₁ = _____

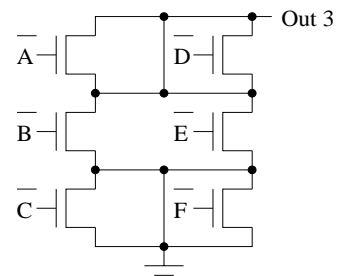
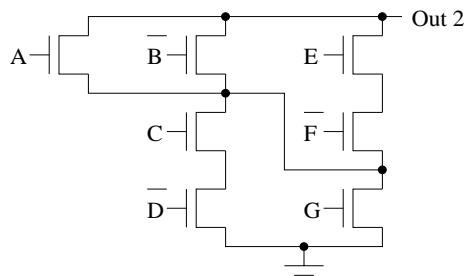
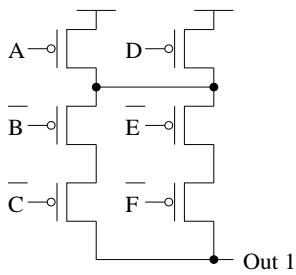
Out₂ = _____

Out₃ = _____





Out₁ = _____ Out₂ = _____ Out₃ = _____



Out₁ = _____ Out₂ = _____ Out₃ = _____