MOSFETs
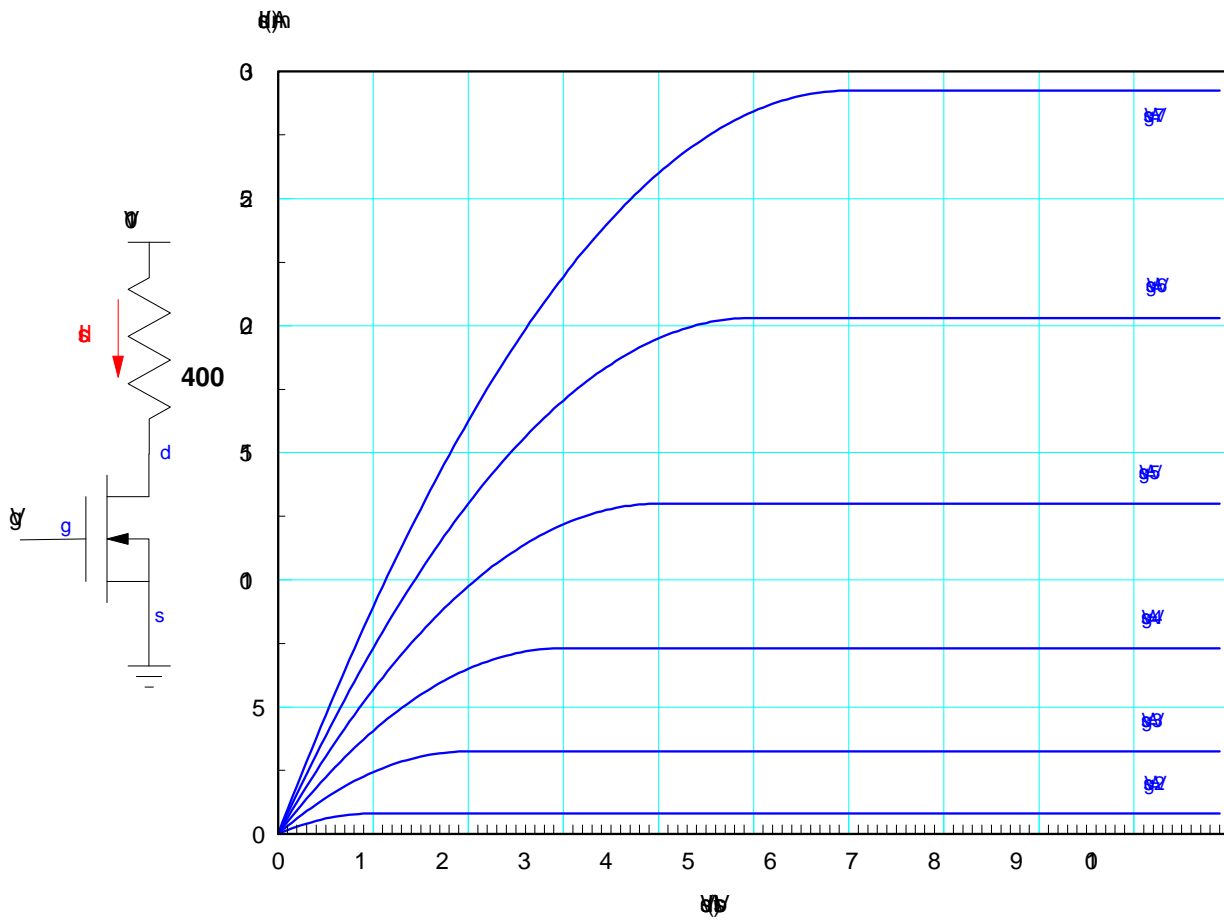
1) The VI characteristics for an n-channel MOSFET are shown below.
   - Label the off / ohmic / and saturated regions
   - Determine the transconductance gain, kn. Assume Vth = 1.00V

2) Draw the load-line for the circuit below. From the load line, determine the Q-point (Vds, Ids) when
   - Vg = 0V
   - Vg = 4V
   - Vg = 7V

The characteristics for a IRF3710 MOSFET are

- Max Current = 57A continuous (180A pulsed)
- Rds = 0.023 Ohms @ 6Vgs = 10V @ Id = 28A
- 2V < Vth < 4V

3) Determine the transconductance gain, kn

4) The CircuitLab model for an IRF3710 MOSFET is

- $k = 48.1147\frac{A}{V^2}$
- $V_{th} = 3.39715V$

Using the CircuitLab parameters, determine the voltages for the following circuit for

- Vin = Vg = 0V
- Vin = Vg = 5V
- Vin = Vg = 10V