

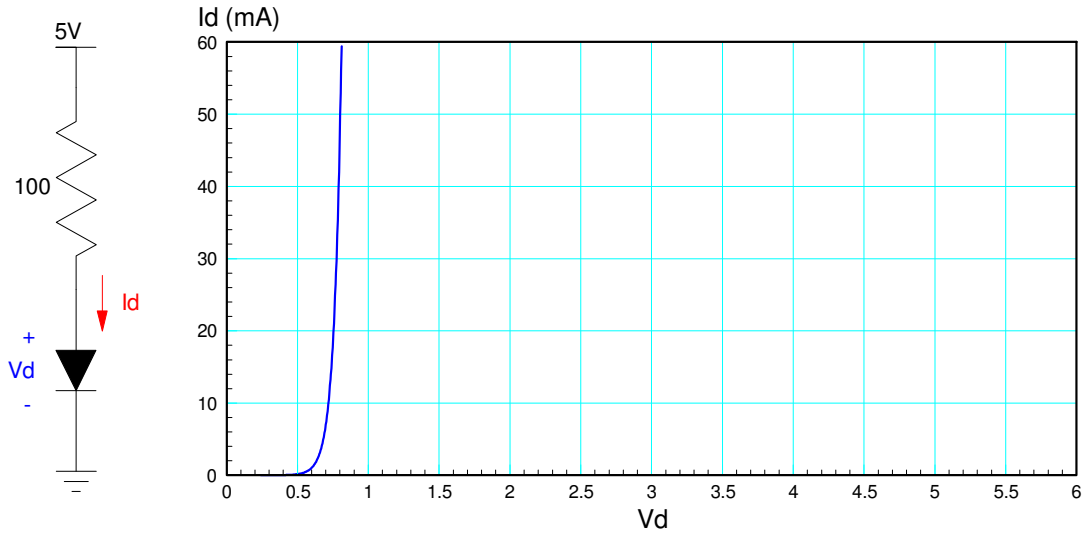
# ECE 320 - Homework #3

Ideal Diodes, LEDs, AC to DC Converters. Due February 1st

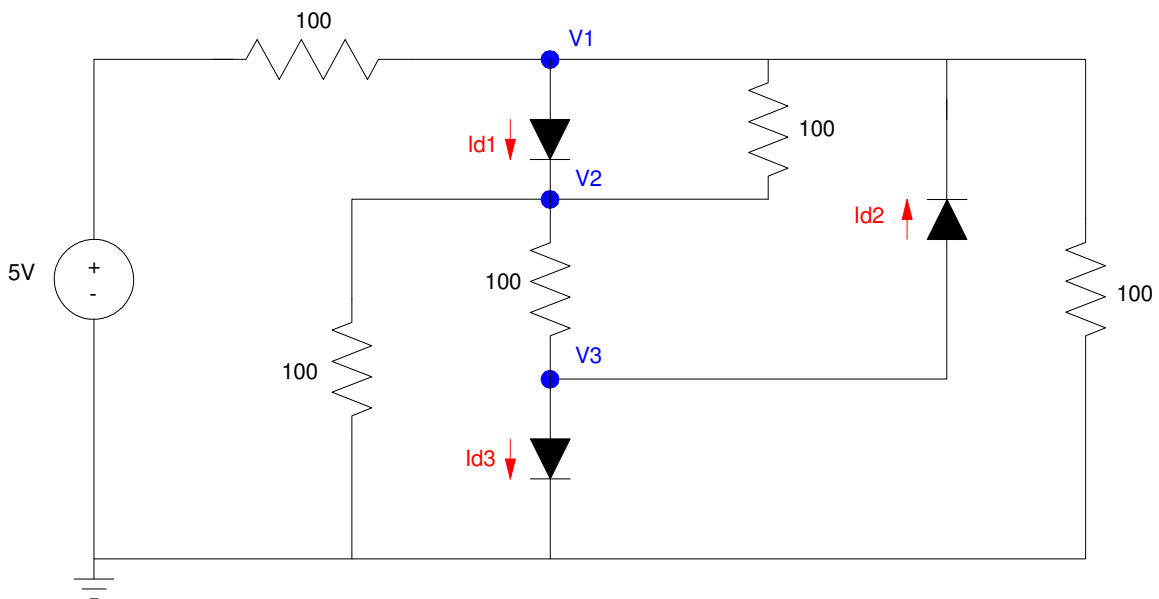
Please make the subject "ECE 320 HW#3" if submitting homework electronically to Jacob\_Glower@yahoo.com (or on blackboard)

## Ideal Diodes

1) Assume ideal silicon diodes ( $V_f = 0.7V$ ). Determine the voltage and the current



2) Assume ideal silicon diodes ( $V_f = 0.7V$ ). Determine the voltages and currents



## LEDs

The specifications for a Piranah RGB LED are

Color	Vf @ 20mA	mcd @ 20mA
red	2.0V	10,000
green	3.2V	10,000
blue	3.2V	10,000

3) Design a circuit to drive these LEDs with a 5V source to produce baby blue:

- Red = 8470 mcd (216/255)
- Green = 9647 mcd (246/255)
- Blue = 9921 mcd (253/255)

4) Design a circuit to drive these LEDs with a 5V source producing burgundy red:

- Red = 6274 mcd (160/255)
- Green = 313 mcd (8/255)
- Blue = 745 mcd (19/255)

Other colors can be obtained from

<https://www.rapidtables.com/web/color/color-wheel.html>

## AC to DC Converters

5) Determine the voltages at V1 and V2 (DC and AC)

6) Build the circuit in CircuitLab (or similar program) and verify your calculations for problem #5

7) Determine C1 and C2 so that AC voltages are: V1 = 2Vpp and V2 = 250mVpp.

8) Build this circuit in CircuitLab (or similar program) and verify your calculations for problem #7

