ECE 320 - Homework #3

LEDs, Clipper Circuits. Due Monday, September 12th

LEDs: The specifications for a Piranah RGB LED are: (\$0.21 ea)



	Vf @ 20mA	mcd @ 20mA	Wavelength	DC Current avg	DC Current Peak
Red	2.0V	8,000	620 nm	30mA	120mA
Green	3.2V	8,000	515 nm	30mA	120mA
Blue	3.2V	8,000	460 nm	30mA	120mA

1) Design a circuit which outputs pink:

• Red = 7800 mcd, Green = 6150 mcd, Blue = 6440 mcd

2) Assume a scoreboard used these LEDs in a 320 x 200 array. How much current would the entire scoreboard take if it output white light (20mA for each color (RGB) for each LED)?

3) A 6W LED ceiling light has the following specifications: (\$4.30 ea)



Dia	Vf @ 600mA	Lumens @ 600mA	Color	DC Current avg	DC Current Peak
4"	10.0V	480	Warm White	600mA	2A

- 3a) Design a circuit which drives this LED light at 100mA.
- 3b) How many lumens this light output at 100mA?

Clipper Circuit:

- 4) Design a clipper circuit which approximates the function Y = 2*ln(X)
- 5) Check your design in PartSim (hint: determine the output voltage at several points)
- 6) Lab: Build this circuit and check the I/O relationship in lab.



Y = 2 * ln(X)