

CPSC 314 Homework 7



Term: Jan 2009, Instructor: Wolfgang Heidrich, heidrich@cs.ubc.ca, <http://www.ugrad.cs.ubc.ca/~cs314>

This problem sheet deals with color. Solutions will be discussed in the labs in the week of March 23–27.

1 Color

For the following questions on the CIE diagram, use the figure on the next page (with D as the “white point”). Attempt to find the values requested as accurately and precisely as possible. **Work neatly! In an exam, marks would be deducted for sloppy work (even if you have the correct idea). Show all your work.**

a) Find the *dominant wavelength* of the three colors F, G, and H, with respect to D. If the color does not have a dominant wavelength, indicate this, and find the dominant wavelength of its complementary color.

F: 554 nm (complementary)

G: 595 nm

H: 537 nm

b) Suppose you had a computer monitor with *four* color primaries, with the following characteristics:

- primary Q, monochromatic light at 470nm
- primary R, with a x -component of chromaticity equal to 0.4, and complementary to Q
- primary H, with chromaticity coordinates indicated on the CIE diagram
- primary S, maximally saturated color complementary to a pure color at 494nm

In the above, *complementary* means with respect to D.

Given these phosphors, draw the points corresponding to their chromaticities on the diagram given (H is already done for you). Also indicate the *gamut* of this display device.

