Homework 2: Contrast Sensitivity
20 Points: Due at the beginning of class, Wednesday, 20 June 2007

There are two parts to this homework assignment. Each part counts 10 points.
Late homework will receive a grade of zero.

Part 1:

In the table below are given the "threshold" contrasts for detecting (at $d_a = 1.0$) sine
wave gratings of various spatial frequencies. Assume that stimuli having amplitude
less than these values would not be visible.

cpd	contrast	cpd	contrast
1.0	0.00409	9.00	0.00208
1.25	0.00377	10.65	0.00278
1.90	0.00274	15.00	0.00489
2.65	0.00229	18.50	0.00845
3.75	0.00175	21.25	0.0150
5.50	0.00157	26.50	0.0377
7.50	0.00164	30.00	0.0702
8.00	0.00198	40.00	0.362

a.   Will a 3.0 cpd sine wave grating with contrast of 0.005 be visible? Why?

b.   Will a 30.0 cpd sine wave grating with contrast of 0.005 be visible? Why?

Part 2:

Using the contrast threshold data in the table, plot (using any computer
graphing program) a graph of the contrast sensitivity function (CSF). Put
contrast sensitivity ($S = 1/$contrast) on the vertical axis and spatial frequency on
the horizontal axis. Plot the x-axis and the y-axis with logarithmic scales.
Compare this graph with CSFs in the textbook. Are they the same or are there
differences?