Exam 3 is coming up.

Wed. June 22, 2016 11:00-12:35PM

G1B-20 (our usually lecture room)

Bring a calculator, cheat sheet (8.5"x11" front and back),

A RULER for ray tracing, and something to write with.

Our third exam largely covers material from book Chapters 2 (Reflection and Refraction) and 3 (Spherical Mirrors and Lenses), HW5, HW6, and HW7, and in the Lectures 7-11. In lecture I have covered the topics of reflection and refraction from flat interfaces, how light rays produce images in flat mirrors, and flat refraction situations (the swimmer’s legs), reflection from spherical mirrors, the ray tracing rules for spherical convex and concave mirrors, refraction by spherical lenses, ray tracing rules for spherical convex (focusing or converging) lenses, spherical concave (diverging) lenses, and how to determine the image locations for many situations. We have worked briefly with the lens equation.

Here are some particular topics that you might find on the exam:

**Spherical Mirrors**
Do you have the three rays for the convex and concave mirrors on your cheat sheet? Can you do ray tracing from the object to the mirror for the three special rays? Can you extrapolate where an observer thinks the rays came from? Is the image REAL, VIRTUAL, UPRIGHT, INVERTED, LARGER or SMALLER than the object?

**Spherical Lenses**
Do you have the three special rays for converging and diverging lenses on your cheat sheet? Can you do the ray tracing, predict images, and answer the standard questions? Is the image REAL, VIRTUAL, UPRIGHT, INVERTED, LARGER or SMALLER than the object?

**The lens equation and mathematical solutions.**
Ray tracing is important. You can solve all lens and mirror problems by drawing and measuring lines. However, there is a mathematical approach too. Can you use 1/X0 + 1/Xi = 1/f? If you are given the object distance and the focal length of a lens, can you find the image distance? What does it mean for the focal length to be negative? What are negative image distances or negative image heights trying to tell you?

**Reflection and refraction for flat interfaces**
Do you remember how reflection angle equals incident angle? Do your remember that you refract closer to the normal when entering materials with slower light speed? What is index of refraction? Do you remember that it can be different for different colors? Rainbows?