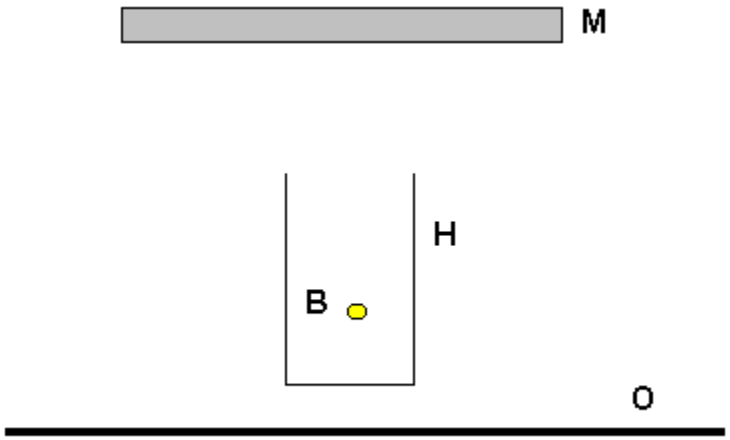
Quiz 4

Phys 221 – Spring 2012

Name: _____

1. In the following diagram, M is a plane mirror; B is a very small bright light bulb that can be treated as a point source of light; and H is an opaque housing that does not transmit light. An observer can stand anywhere along a line O to try to see the image of the light bulb in the mirror.

By using relevant rays of light, determine those locations along the line O from which the image of B is visible and those locations from which it is not visible. Mark the regions along line O accordingly and explain the reasoning you used in drawing the rays.



2. Calculate the energy of a blue photon (470 nm) and a red photon (650 nm). Which one has more energy? Does this seem reasonable to you, why?

3. A student is using the *method of parallax* to locate an image in a plane mirror. She has placed her finger behind the mirror where it appears the image is located. When she moves her head to the right, her finger moves to the right relative to the image. Where is her finger located compared to the image?

$v = \lambda f$ $\quad E = hf$ $\quad h = 6.63 \times 10^{-34}$ J/s

Law of Reflection: $\theta_i = \theta_r$ $\quad$ Snell's Law: $\sin\theta_1 = \sin\theta_2$ $\quad c = 2.998 \times 10^{8}$ m/s