**Assignment 1**

1) Draw the image produced by the following object. Make sure to draw all three rays from your object to your image. Describe the characteristics of your image (smaller/bigger than object, inverted/upright, and real/virtual). (7 marks)

2) If your object were right side up as opposed to the drawing in the previous question, how would your new image compare with the characteristics of your image in #1? (2 marks)

3) The image is drawn for you. Locate and draw the object by tracing backwards from your 3 rays. (5 marks)

4) Consider all your concave/convex mirrors and lenses. Do their virtual images usually have a negative or positive a) Height? b) Distance from mirror/lens? (2 marks)

5) Why is there a negative sign in the magnification equation in front of hi/ho, but not for do/di? (1 mark)

6) A 1.6cm object is placed 5.0cm from a concave mirror with focal length 7.5cm. Find:

a) The image distance from the mirror. (3 marks)

b) The height of the image. (2 marks)

c) The magnification. (2 marks)

7) If you have a light bulb, a pinhole on a cardboard, and a convex lens, how would you position these 3 objects so you create parallel light rays (collimated light)? Remember light rays diverge from your light bulb and your convex lens has a focal point *p*. Draw a diagram to explain your thinking. (3 marks)

Bonus question

A compound microscope uses 2 convex lenses, an objective lens and an eyepiece lens. The objective lens is placed immediately in front of your object, focusing the image for the eyepiece lens to magnify. The objective lens has a shorter focal length than the eyepiece lens. In our example below, the objective has a 7.5mm focal length and the eyepiece has a 1.5cm focal length. The distance between the 2 lenses is 3.0cm. If an object is placed 14mm from the objective lens, where is the location of the image relative to the eyepiece lens? Is this image upright or inverted? The diagram below is not drawn to scale. (5 marks)