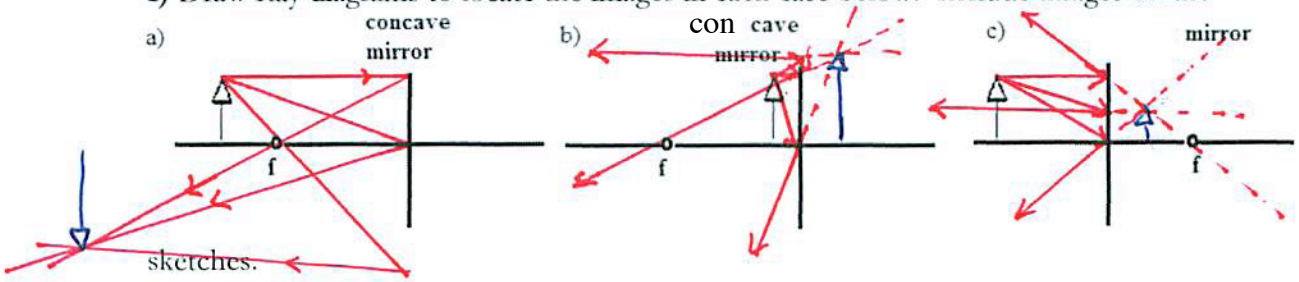
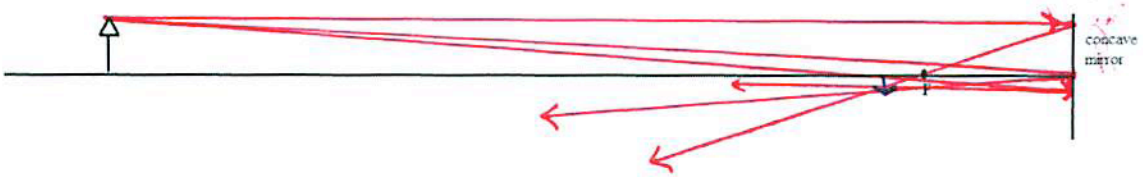
IB Physics I WS 5 Name: KEY Per:

1) Draw Ray diagrams to locate the images in each case below. Include images on the sketches.



2) A 10.0 cm object is placed 120 cm in from a concave mirror with a focal length of 20.0 cm. Make a ray diagram and determine:



a) the location of the image. (How far is it from the mirror?)

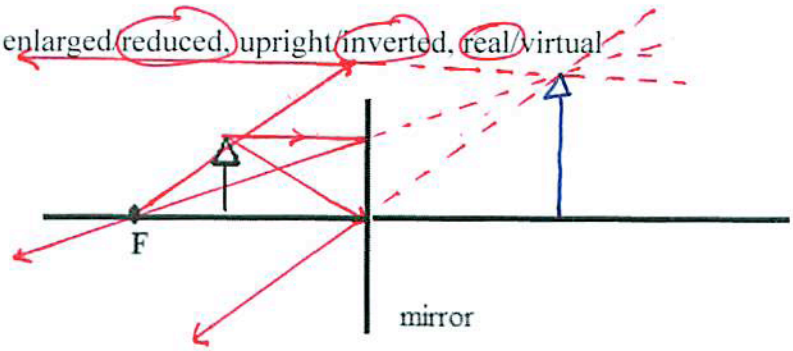
$\frac{1}{f} = \frac{1}{d_i} + \frac{1}{d_o}$ $d_i = \left(\frac{1}{f} - \frac{1}{d_o}\right)^{-1} =$ **24 cm**

b) the size of the image

$-\frac{d_i}{d_o} = \frac{h_i}{h_o} \Rightarrow h_i = -\frac{d_i}{d_o} \cdot h_o = -\frac{24\,cm}{120\,cm} \cdot 10\,cm =$ **2 cm**

c) The image is (*circle correct ones*) enlarged/reduced, upright/inverted, real/virtual

3) An object is placed 5.00 cm inside the focus of a parabolic mirror with focal length of 15.0 cm. Draw a ray diagram and answer:



a) Where is the image? (*I want a sentence, with a number in it*)

$\frac{1}{f} = \frac{1}{d_i} + \frac{1}{d_o} \Rightarrow d_i = \left(\frac{1}{f} - \frac{1}{d_o}\right)^{-1} = \left(\frac{1}{15\,cm} - \frac{1}{10\,cm}\right)^{-1} = -30\,cm \Rightarrow$ The object is 30 cm behind the mirror.

b) If the object is 6.00 mm high, how large is the image?

$M = \frac{h_i}{h_o} = -\frac{d_i}{d_o} \Rightarrow h_i = -\frac{d_i}{d_o} \cdot h_o = -\frac{(-30\,cm)}{10\,cm} \cdot 6\,mm =$ **18 cm**