

## Locating Images in Curved Mirrors

### Section 1 – Prelab [2 marks ]

Fill out the “Purpose” (Learning Goals) and chart below BEFORE you complete the lab. Show your teacher when you are finished for approval.

1. Purpose of the Lab (what are we trying to achieve, what are the Learning Goals of the Lab?):

2. State the LOST for each of the following tables:

#### **Concave Mirrors:**

Object location	Location of image	Orientation/Attitude of image	Size of image	Type of image
beyond C				
at C				
between C and F				
at F				
inside F				

#### **Convex Mirrors:**

Object location	Location of image	Attitude of image	Size of image	Type of image
Close to mirror				
Far from mirror				

**Section 2: Lab – Complete the following tasks [C 10 marks ]:**

a) Place the less curved concave mirror in the space below. Shine 3 – 5 parallel light rays at the mirror. Trace the reflected rays. Label your diagram with the following: angle of incidence, angle of reflection, incident ray, reflected ray, normal. Measure the focal length of the concave mirror and record this value.

Draw an object ↑ at a distance of two times the focal point. Predict the location of the image and then locate the image on your diagram. (Use a different colour to distinguish the rays of incidence and reflection for the object.) State the 4 image characteristics of an image in a concave mirror if the object is placed at 2F.

Focal length of concave mirror: \_\_\_\_\_

b) Now place the more curved concave mirror in the space below. Shine 3 – 5 parallel light rays at the mirror. Trace the reflected rays. Label your diagram with the following: angle of incidence, angle of reflection, incident ray, reflected ray, normal. Measure the focal length of the concave mirror and record this value. What, if any, are the differences between the less curved and the more curved concave mirror?

Focal length of concave mirror: \_\_\_\_\_

c) Place the less curved convex mirror in the space below. Shine 3 – 5 parallel light rays at the mirror. Trace the reflected rays. Label your diagram with the following: angle of incidence, angle of reflection, incident ray, reflected ray, normal. Measure the focal length of the convex mirror and record this value.

Draw an object ↑ at a distance of two times the focal point. Predict the location of the image and then locate the image on your diagram. State the 4 image characteristics of an image in a convex mirror if the object is placed at a distance of  $2F$ .

Focal length of convex mirror: \_\_\_\_\_

d) Now place the more curved convex mirror in the space below. Shine 3 – 5 parallel light rays at the mirror. Trace the reflected rays. Label your diagram with the following: angle of incidence, angle of reflection, incident ray, reflected ray, normal. Measure the focal length of the convex mirror and record this value. What, if any, are the differences between the less curved and the more curved convex mirror?

Focal length of convex mirror: \_\_\_\_\_

**Section 3 – Post Lab Discussion Questions [T/I – 11 marks, 1 mark each]:**

1. What type of image(s) does a concave mirror produce?
2. Where must an object be located for a concave mirror to produce a real image?
3. What happens to the size of the real image in a concave mirror as the object is slowly moved from its original position beyond C toward F?
4. What is the only location where a concave mirror will not produce an image?
5. Where must an object be located for a concave mirror to produce a virtual image?
6. What type(s) of image(s) does a convex mirror produce?
7. Can a convex mirror ever produce a real image? Why or why not? Explain.
8. Is there ever a position where an object will not have an image produced in a convex mirror? Explain using your knowledge from the lab.
9. What images are produced in all plane mirrors?
10. **Conclusions:** Write a conclusion to summarize the characteristics of the images formed in a concave mirror and a convex mirror.
11. Did your observations correspond to the Prelab chart? Explain any discrepancies.