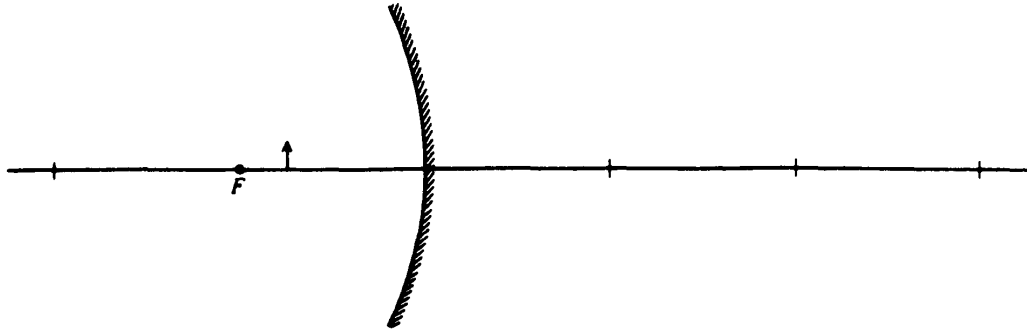


Name: \_\_\_\_\_ Date: \_\_\_\_\_

## AP Optics: Mirror Worksheet 4

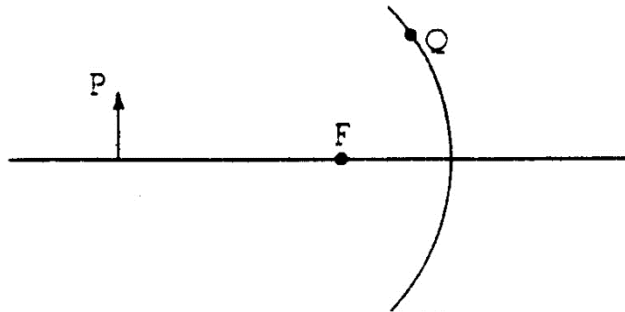


1. The concave mirror shown above has a focal length of 20 centimeters. An object 3 centimeter high is placed 15 centimeters in front of the mirror.

- Using at least two principal rays, locate the image on the diagram above.
- Is the image real or virtual? Justify your answer.

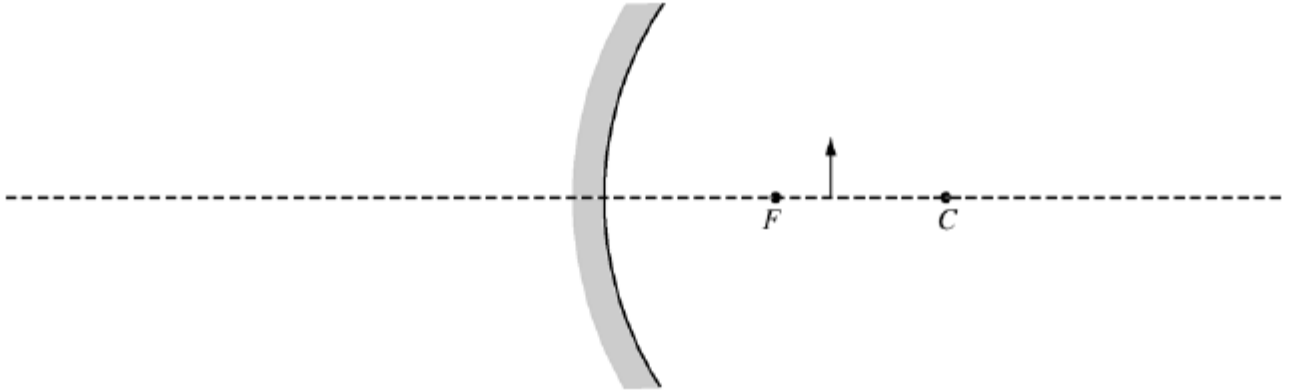
c. Calculate the distance of the image from the mirror.

d. Calculate the height of the image.



2. An object 6 centimeters high is placed 30 centimeters from a concave mirror of focal length 10 centimeters as shown above.

- On the diagram above, locate the image by tracing two rays that begin at point P and pass through the focal point F.
- Is the image real or virtual?
- Is it located to the left or to the right of the mirror?
- Calculate the position of the image.
- Calculate the size of the image.



3. The figure above shows a converging mirror, its focal point  $F$ , its center of curvature  $C$ , and an object represented by the solid arrow.

(a) On the figure above, draw a ray diagram showing at least two incident rays and the image formed by them.

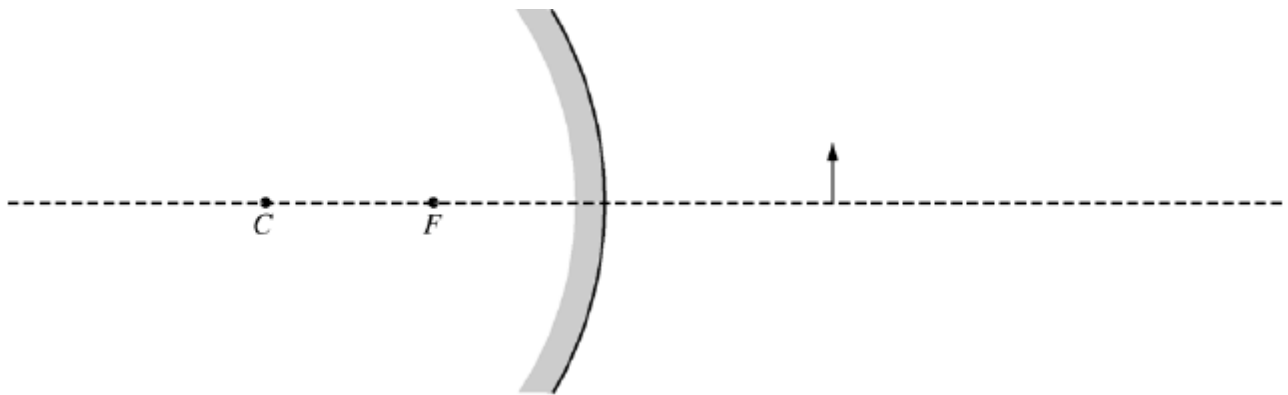
(b) Is the image real or virtual?

\_\_\_ Real \_\_\_ Virtual

Justify your answer.

(c) The focal length of this mirror is 6.0 cm, and the object is located 8.0 cm away from the mirror. Calculate the position of the image formed by the mirror. (Do NOT simply measure your ray diagram.)

(d) Suppose that the converging mirror is replaced by a diverging mirror with the same radius of curvature that is the same distance from the object, as shown below.



For this mirror, how does the size of the image compare with that of the object?

\_\_\_ Larger than the object \_\_\_ Smaller than the object \_\_\_ The same size as the object

Justify your answer.