

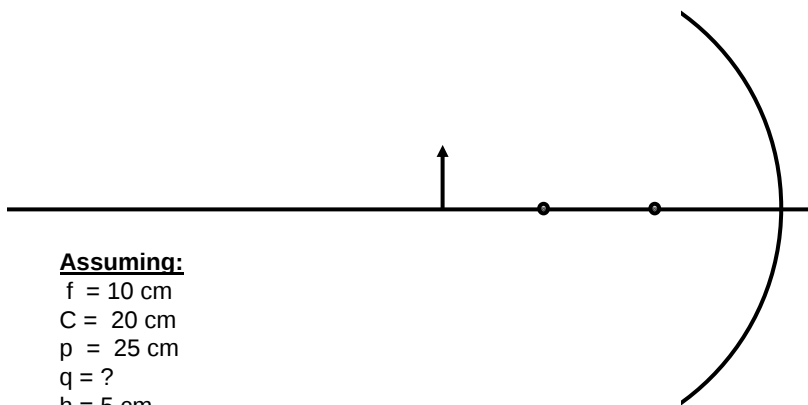
Name: \_\_\_\_\_  
Date: \_\_\_\_\_  
Section      C      D      F

**Ray Diagrams: Mirrors**

1. **For the following images, please calculate image distance, image height, and magnification.**
2. The following slides illustrate an image being reflected by a curved mirror. The only element that changes is the object distance, and from that the image distance changes, as well as the image height and magnification. Certain elements are the same, such as radius of curvature and height of the object.
3. Remember the 4 rules of mirrors:
  - i. Any ray that travels parallel to the principal axis reflects to the focal point.
  - ii. Any ray that travels through the focal point reflects parallel to the principal axis.
  - iii. Any ray that travels through the center reflects back to the center.
  - iv. Any ray that strikes the mirror at point  $\chi$  is reflected over the principal axis (the principal axis acts as the normal).
4. Rays must converge to create an image point. If rays diverge on one side of the mirror, they must converge on the other side of the mirror. This is evident when an object is within the focal point of a concave mirror, and at all distances from a convex mirror.
5. Please consult the textbook pages 534-539 to ensure that your diagrams are correct.
6. Please use the "Links" page on [\*The Vault\*](#) for supplemental applets, diagrams, and explanations.

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**Object Distance greater than C**

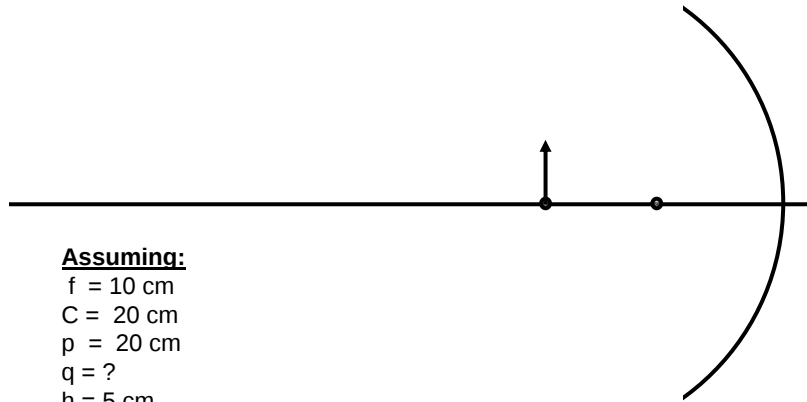


**Assuming:**

$f = 10 \text{ cm}$   
 $C = 20 \text{ cm}$   
 $p = 25 \text{ cm}$   
 $q = ?$   
 $h = 5 \text{ cm}$   
 $h' = ?$   
 $M = ?$

**Concave Mirrors    2**

Object Distance at C

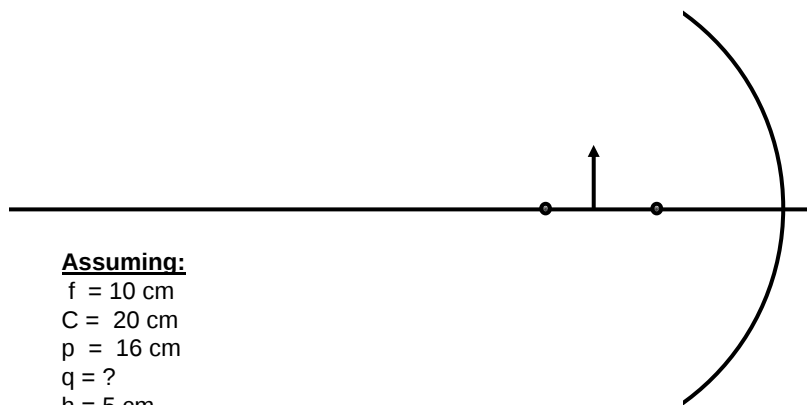


**Assuming:**

$f = 10 \text{ cm}$   
 $C = 20 \text{ cm}$   
 $p = 20 \text{ cm}$   
 $q = ?$   
 $h = 5 \text{ cm}$   
 $h' = ?$   
 $M = ?$

Concave Mirrors 3

Object Distance between C and F

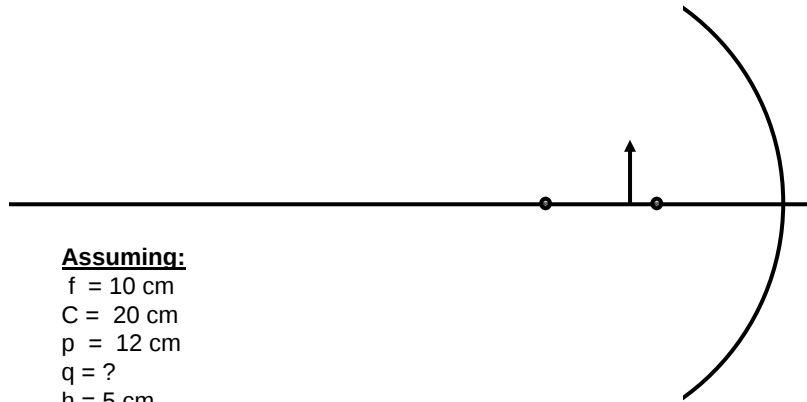


**Assuming:**

$f = 10 \text{ cm}$   
 $C = 20 \text{ cm}$   
 $p = 16 \text{ cm}$   
 $q = ?$   
 $h = 5 \text{ cm}$   
 $h' = ?$   
 $M = ?$

Concave Mirrors 4

### Object Distance between C and F

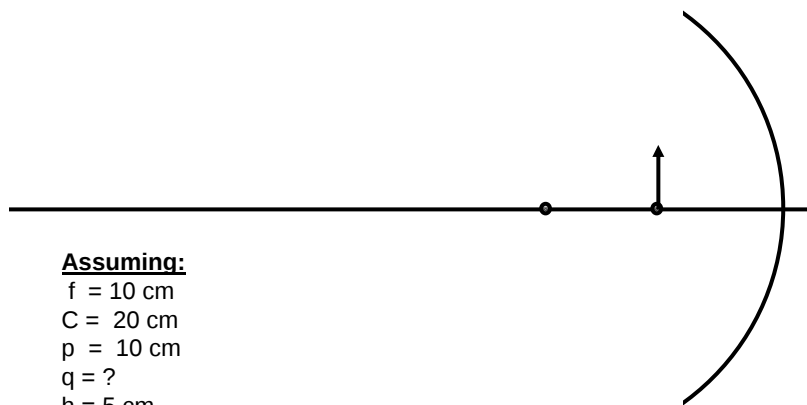


**Assuming:**

$f = 10 \text{ cm}$   
 $C = 20 \text{ cm}$   
 $p = 12 \text{ cm}$   
 $q = ?$   
 $h = 5 \text{ cm}$   
 $h' = ?$   
 $M = ?$

Concave Mirrors 5

### Object Distance at F

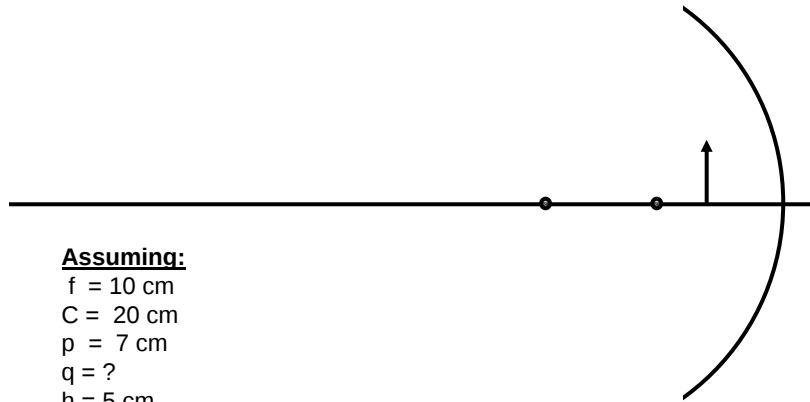


**Assuming:**

$f = 10 \text{ cm}$   
 $C = 20 \text{ cm}$   
 $p = 10 \text{ cm}$   
 $q = ?$   
 $h = 5 \text{ cm}$   
 $h' = ?$   
 $M = ?$

Concave Mirrors 6

Object Distance less than F



**Assuming:**

$f = 10$  cm

$C = 20$  cm

$p = 7$  cm

$q = ?$

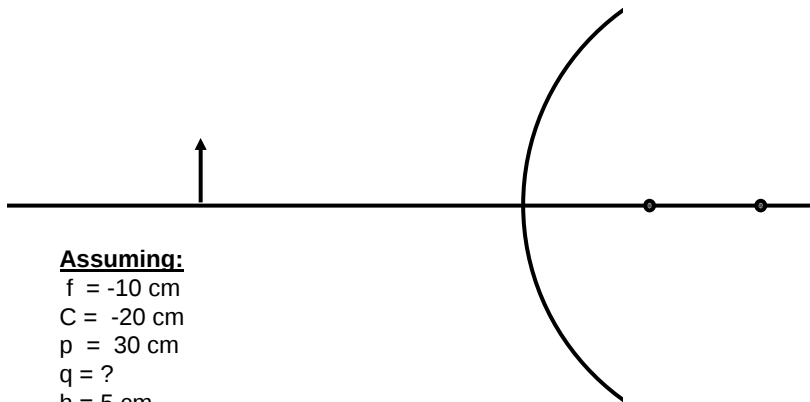
$h = 5$  cm

$h' = ?$

$M = ?$

Concave Mirrors 7

Object Distance greater than C



**Assuming:**

$f = -10$  cm

$C = -20$  cm

$p = 30$  cm

$q = ?$

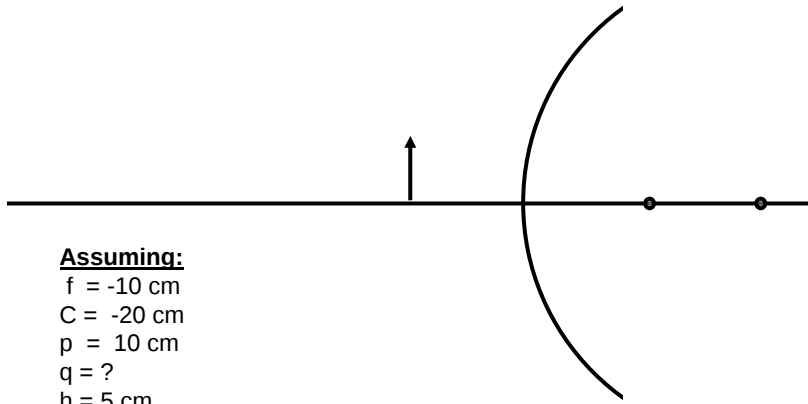
$h = 5$  cm

$h' = ?$

$M = ?$

Convex Mirrors

Object Distance at  $f$



**Assuming:**

$f = -10$  cm

$C = -20$  cm

$p = 10$  cm

$q = ?$

$h = 5$  cm

$h' = ?$

$M = ?$

Convex Mirrors