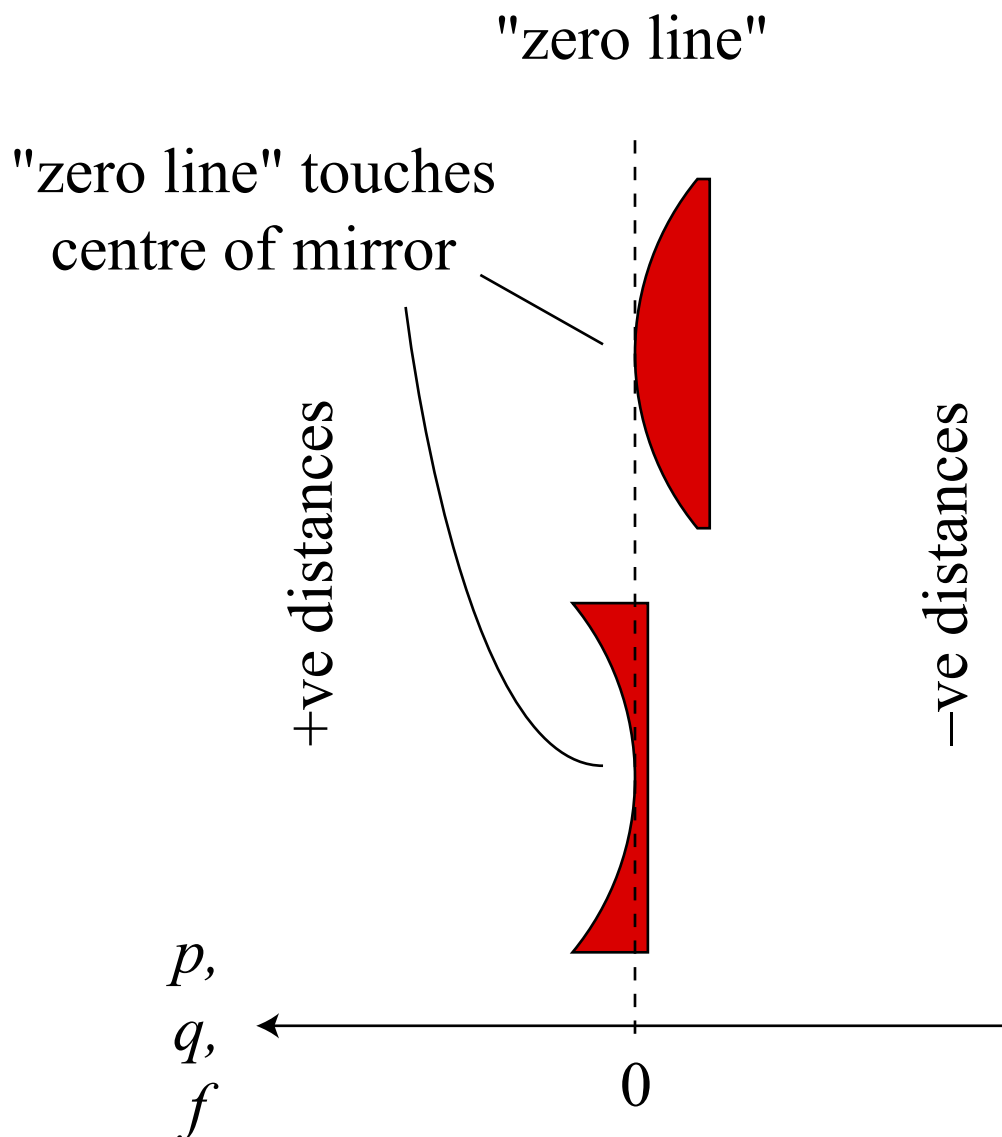


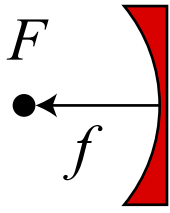
# 1.3.7 Sign convention for mirrors

Benson 35.7, p. 724

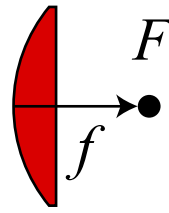
To describe imaging mathematically we introduce the **object distance**,  $p$ , **image distance**,  $q$ , and **focal length**,  $f$ , as the respective distances of the object, the image, and the focal point from the "zero line":



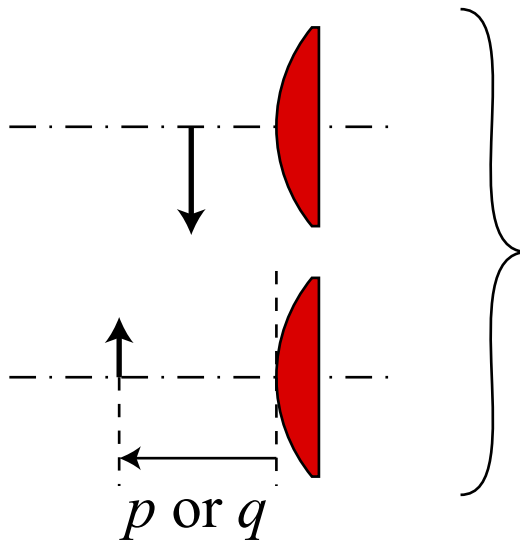
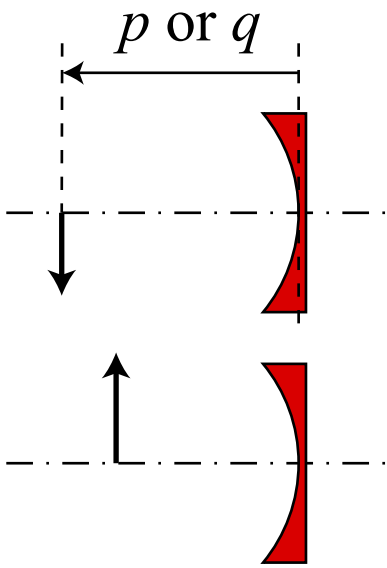
**examples:**



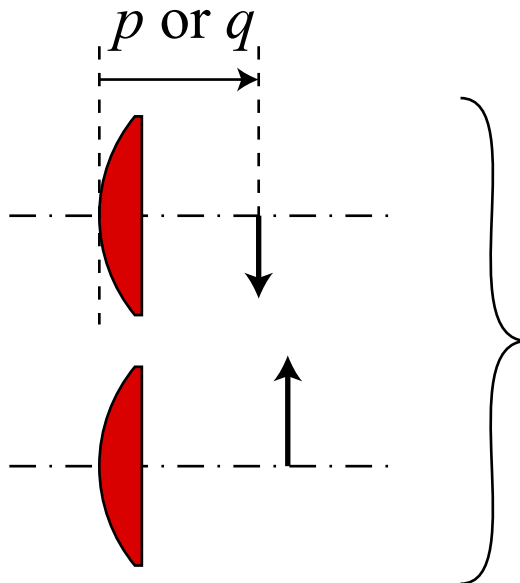
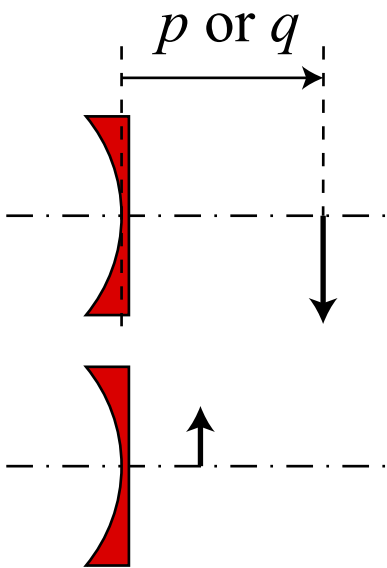
positive focal length  
(concave mirrors)



negative focal length  
(convex mirrors)



positive object or  
image distances;  
real objects and images  
(see section 1.3.8)



negative object or  
image distances;  
virtual objects and  
images (section 1.3.8)

## 1.3.8 Mirror equation

Benson 35.7, p. 724 (incl. simple derivation)

When the object distance,  $p$ , image distance,  $q$ , and focal length,  $f$ , are defined as outlined in the previous section they are related through the following, very important, **mirror equation**:

$$\frac{1}{p} + \frac{1}{q} = \frac{1}{f}$$

