Virtual images with a concave mirror

Principle and equipment

Principle

Demonstrate that virtual images are formed by a concave mirror if the object lies within the single focal length, and show their properties.

Equipment

Position No.	Material	Order No.	Quantity
1	Demo Physics board with stand	02150-00	1
2	PHYWE Multitap transformer, DC: 2/4/6/8/10/12 V, 5 A / AC: 2/4/6/8/10/12/14 V, 5 A	13533-93	1
3	Lamp,halogen,mag.held,12V/50W	08270-20	1
4	Light box 12V/20W,w.magn.base	09804-00	1
5	Concave/convex mirror,magnet held	08270-12	1
Additional material:			
	Ruler		
	Circular template (see master) or a drawing compass		
	Water-soluble white board pen		

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Set-up and procedure

- Draw the optical axis.
- Using the circular template or a drawing compass, draw a circle with radius r = 200 mm on the magnet optics board.
- Place the mirror on the circular arc.
- Mark the centre of curvature and the focal point (r = 200 mm; f = 1 00 mm).
- Draw an image arrow within the single focal length (e.g. G = 50 mm, g =50 mm).
- Place the magnet-held lamp and the light box, each with a one-slit diaphragm, on the magnet optics panel so that a parallel and a focal point ray pass through the arrow head and are reflected by the mirror.
- Draw the light beams as completely as you can.
- Draw a second image arrow closer to the focal point and proceed analogously.
- Remove the lamps and mirror.
- Draw the light paths in front of the mirror, and then extend the reflected beams to their intersection points.
- Draw the image arrows (Fig. 1).

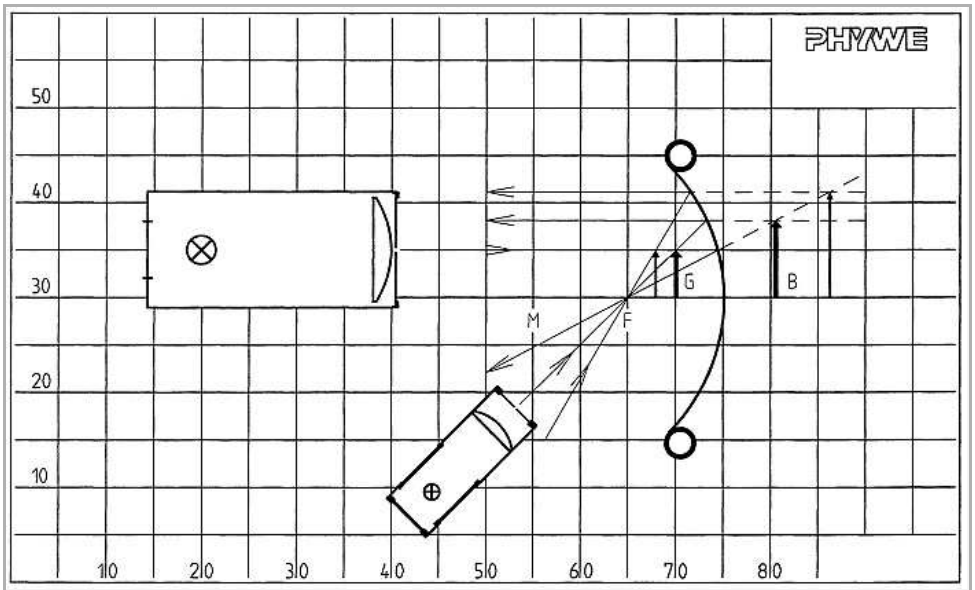

Fig. 1

Observation and evaluation

A concave mirror produces upright, virtual images of objects which lie within the simple focal length. The closer the object to the focal point, the larger the image.

Remark
To make a circular template the master copy (see Fig. 1 in the Foreword) can be copied, pasted on thin cardboard and cut to size.

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