

Image formation by a plane mirror

Principle and equipment

Principle

Demonstrate how an image is formed by a plane mirror.

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	Plane mirror, magnet held	08270-13	2
Additional material:			
	Ruler		
	Water-soluble white board pen		

Set-up and procedure

- Draw the plane of the mirror on the magnetic optics panel.
- Position the plane mirrors.
- Draw a "1" as object (about 100 mm high at a distance of about 150 mm from the mirrors).
- Position the magnet-held lamp and the light box, each with one-slit diaphragm, so that the rays pass through a selected object point, e.g. the tip, and are reflected by the mirror (Fig. 1).
- Draw the paths of the rays. In the same way, draw the paths to additional object points (base of the "1", etc.).
- Remove the lights and the mirrors.
- Complete the light paths in front of the mirrors and extend all reflected rays behind the mirrors.
- Connect the thus determined virtual image points to form a complete image (Fig. 2).

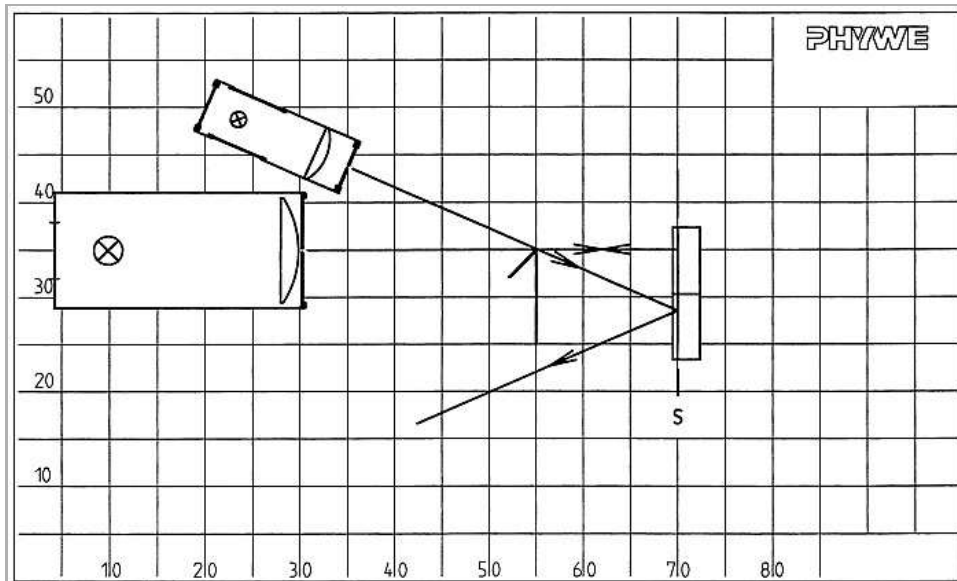


Fig. 1

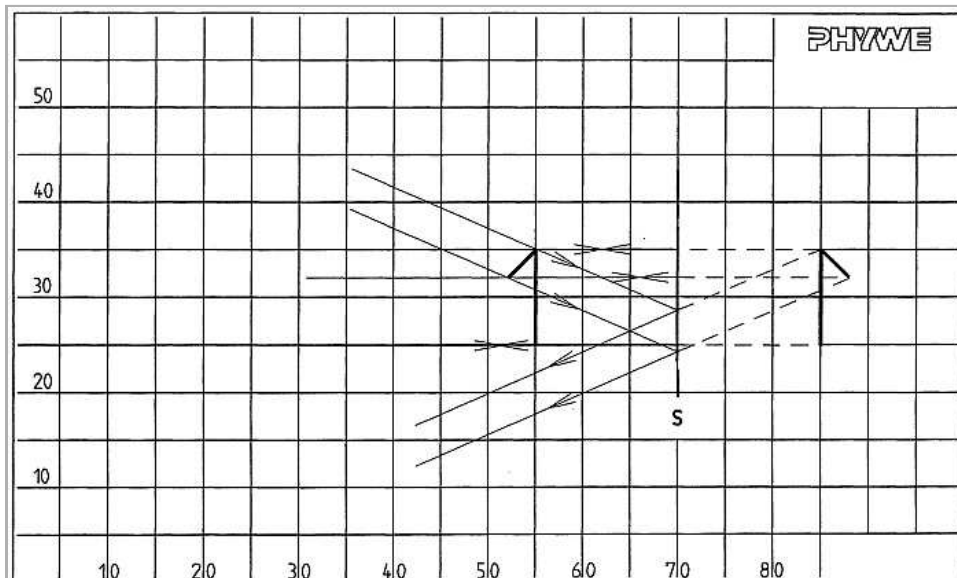


Fig. 2

Observation and evaluation

By projecting arbitrary points of an object, its image in a plane mirror can be found. The image is virtual, upright and as large as the object. Image and object are symmetrical to the plane of the mirror.

Remark

From Figures 1 and 2, it is evident one of the two rays which passes through each object point travels perpendicular to the plane of the mirror and thus is reflected back on itself. This facilitates the construction of the image points.

If it should also be shown that any two rays which pass through an object point can be used to determine an image point, one should vary the construction of the individual image points.