

13.2 Images Formed by Mirrors

Name: _____ Class: _____ Date: _____ **Total: 11 marks**

KEY WORDS mirror equation 镜面公式 • magnification 放大率 • concave mirror 凹面镜
• virtual image 虚像 • curved mirrors 曲面镜

Objective

Build the skills to answer exam questions on **images formed by mirrors**.**You must be able to:**

- use ray diagrams to locate images from **plane** and **curved mirrors** 曲面镜
- apply the **mirror equation** 镜面公式 $\frac{1}{s_o} + \frac{1}{s_i} = \frac{1}{f}$
- describe an image as real or virtual, upright or inverted, and find its **magnification** 放大率

1 Worked examples

Study these first. Each one shows the method for a question type used later.

■ The mirror equation

$\frac{1}{s_o} + \frac{1}{s_i} = \frac{1}{f}$, where s_o is the object distance, s_i the image distance, and f the focal length.

■ Magnification

$m = -\frac{s_i}{s_o}$ — a negative m means inverted.

■ Real or virtual

A positive s_i is a **real** image (in front, inverted); a negative s_i is a **virtual** image (behind, upright), as with a plane mirror.

2 Practice

2.1 An object is 20 cm from a concave mirror of focal length 10 cm. Find the image distance. [2]

2.2 State whether a plane mirror forms a real or a virtual image. [1]

2.3 Find the magnification when $s_i = 15$ cm and $s_o = 30$ cm. [2]

3 Exam-style questions

3.1 The mirror equation is [1]

- | | |
|---|---|
| A | $\frac{1}{s_o} + \frac{1}{s_i} = \frac{1}{f}$ |
| B | $s_o + s_i = f$ |
| C | $s_o s_i = f^2$ |
| D | $s_i - s_o = f$ |

3.2 A virtual image formed by a mirror is [1]

- | | |
|---|-------------------------------------|
| A | in front of the mirror and inverted |
| B | behind the mirror and upright |
| C | always at the focus |
| D | always larger than the object |

3.3 An object is placed 24 cm from a concave mirror of focal length 8.0 cm.

(a) Find the image distance. [3]

(b) State whether the image is real or virtual. [1]

