

Exercise walk-through

Reflection ■ 13.1

eXercise

You must be able to

- model light as a **ray** 光线 travelling in straight lines in a uniform medium
- state and apply the **law of reflection** 反射定律: the angle of incidence equals the angle of reflection
- distinguish **specular** 镜面反射 from **diffuse** 漫反射 reflection

Method — The ray model

Light travels in **straight lines** in a uniform medium; a ray shows its path and direction.

Method — Law of reflection

The **angle of incidence equals the angle of reflection**, both measured from the **normal** (the line perpendicular to the surface).

Method — Specular vs diffuse

A smooth surface gives **specular** reflection (a clear image); a rough surface scatters light in all directions — **diffuse** reflection.

Practice 2.1 ■ 1 mark

A ray strikes a mirror at 30° to the normal. State the angle of reflection.

Solution 2.1

Method: Law of reflection

Worked steps

30° **B1**.

Practice 2.2 ■ 2 marks

State the difference between specular and diffuse reflection.

Solution 2.2

Method: Specular vs diffuse

Worked steps

specular reflection is from a smooth surface and forms a clear image **B1**; diffuse reflection is from a rough surface and scatters the light **B1**.

Practice 2.3 ■ 1 mark

State the line from which the angle of incidence is measured.

Solution 2.3

Method: Law of reflection

Worked steps

the normal (the line perpendicular to the surface) **B1**.

Exam-style 3.1 ■ 1 mark

The law of reflection states that the angle of incidence equals the angle of

- A** refraction
- B** reflection
- C** incidence doubled
- D** 90°

Solution 3.1

Method: Law of reflection

A refraction

B reflection



C incidence doubled

D 90°

Worked steps

B.

Exam-style 3.2 ■ 1 mark

A rough wall reflects light mainly by

A specular reflection

B diffuse reflection

C refraction

D absorption only

Solution 3.2

A specular reflection

B diffuse reflection



C refraction

D absorption only

Worked steps

B.

Exam-style 3.3 ■ 1 mark

A ray strikes a plane mirror at 25° to the **mirror surface**.

- (a) Find the angle of incidence (measured from the normal).
- (b) Find the angle of reflection.

Solution 3.3

Method: Law of reflection

Worked steps

(a) $90^\circ - 25^\circ = 65^\circ$ **B1**. (b) 65° **B1**.