

Recall what you have learnt

Laws of reflection

- The **incident ray**, the **reflected ray** and the **normal** all lie in the same plane.
- **Angle of incidence = angle of reflection**

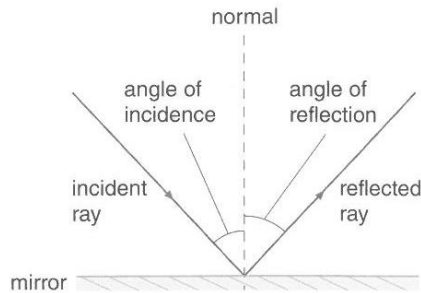


Fig 1.3 Reflection of light.

Regular reflection

- Occurs on a flat, smooth surface (e.g. a plane mirror).
- Parallel rays are reflected in the same direction.
- A clear image is formed.

Diffuse reflection

- Occurs on a rough surface (e.g. a sheet of paper).
- Parallel rays are reflected towards different directions.
- No image or a distorted image is formed.

A ray diagram can show how we see the image formed by a plane mirror (Fig 1.4).

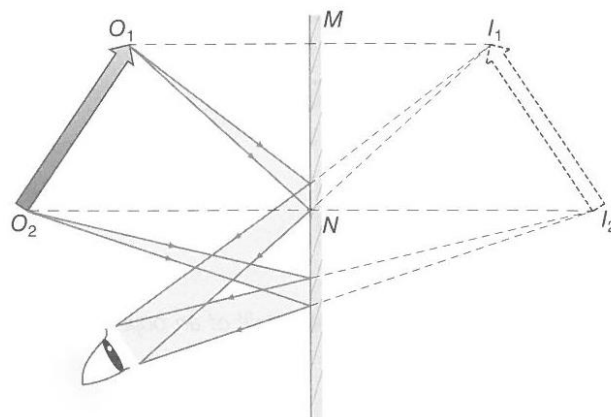


Fig 1.4 Seeing the image formed by a plane mirror.

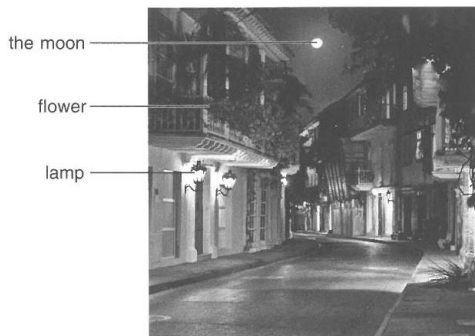
Basic Level (Multiple Choice)

1 Which of the following statements is **incorrect**?

- A Light from the sun reaches the eye as parallel rays.
- B We can see a candle flame because it emits light into our eyes.

- C Light from a point on a near object reaches the eye as divergent rays.
- D We can see a sheet of black paper because it reflects black light into our eyes.

2 Which of the following are non-luminous objects?



- (1) Lamp
- (2) Flower
- (3) The moon
- A (2) only
- B (1) and (3) only
- C (2) and (3) only
- D (1), (2) and (3)

3 Which of the following objects can reflect light?

- (1) Mirror
- (2) A rippling water surface
- (3) Banana

- A (1) and (2) only
- B (1) and (3) only
- C (2) and (3) only
- D (1), (2) and (3)

4 Take out your mobile phone and turn it on. Which of the following statements is **incorrect**?



- A You can see the icon on the screen because the screen emits light to reach your eyes.
- B You can see the button because it reflects light from the surroundings.
- C The light from a point on the screen reaches your eyes as convergent rays.
- D The light from a point on the button reaches your eyes as divergent rays.

5 Which of the following statements about light is/are correct?

- (1) Sunlight is a form of energy.
- (2) Light from a star can travel in empty space to reach the earth.
- (3) It takes zero time for sunlight to travel to the earth.

- A (1) and (2) only
- B (1) and (3) only
- C (2) and (3) only
- D (1), (2) and (3)

★6 Can the path of a light beam be seen in a vacuum? What is the reason?

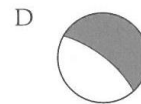
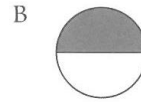
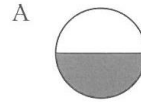
- A Yes, because light can travel through a vacuum into our eyes.
- B No, because light travels very fast in a vacuum.

- C No, because light is absorbed in a vacuum.
- D No, because no light is reflected in a vacuum into our eyes.

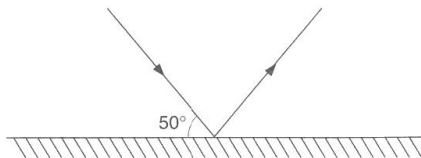
★7 In a dark room, a ball is shone by a torch as shown.



Which of the following figures best describes the bright and dark regions on the ball?



8 In the figure, a ray of light strikes a plane mirror.



What is the angle of reflection?

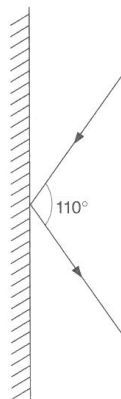
Helper: What is the angle of incidence?

- A 40°
- B 50°
- C 80°
- D 130°

9 In the figure, a ray of light strikes a plane mirror. What is the angle of reflection?

Helper: 110° = angle of incidence + ?

- A 35°
- B 55°
- C 70°
- D 110°



10 Which of the following about diffuse reflection is **incorrect**?

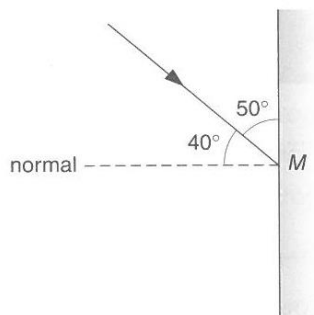
- A In diffuse reflection, incident rays from different directions are reflected in the same direction.
- B Diffuse reflection occurs on a rough surface.

- C The laws of reflection can be applied to diffuse reflection.
- D Diffuse reflection enables us to see non-luminous objects.

Challenging level

11

A ray strikes a plane mirror at point M as shown in the figure.



(a) What is the angle of incidence? (1 mark)

(b) Complete the diagram by drawing the reflected ray and labelling the size of the angle of reflection. (2 marks)

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The figure shows a beautiful scene due to reflection.

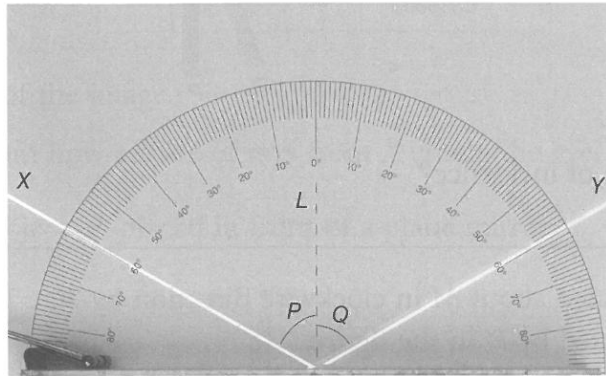


13

(a) State the type of reflection that occurs on the water surface. (1 mark)

(b) Explain what happens to the image when wind blows the water surface. (2 marks)

- 14 As shown in the figure, a ray of light from the left hits a plane mirror and is reflected.



(a) Name the following.

(3 marks)

Ray X : _____

Ray Y : _____

The imaginary line L : _____

(b) (i) Name angles P and Q .

(2 marks)

(ii) Read the sizes of angles P and Q from the figure.

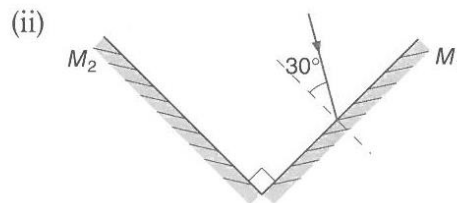
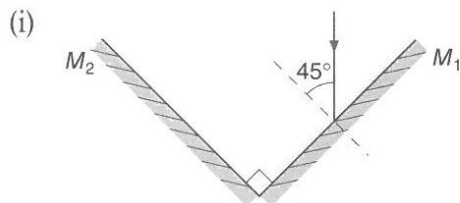
(2 marks)

(iii) What is the relationship between angles P and Q ?

(1 mark)

- 15 A device consists of two mirrors perpendicular to each other.

(a) A ray of light is incident on one of the mirrors. Complete the path of the ray in each of the following cases.

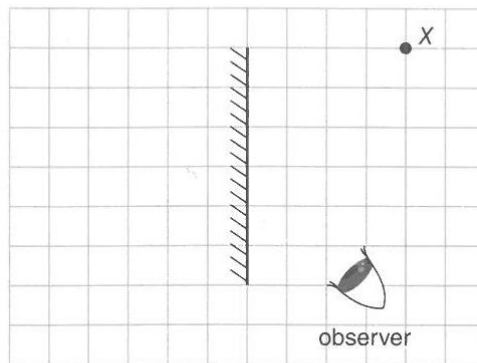


(4 marks)

(b) How is the direction of the outgoing ray related to that of the incoming ray?

(2 marks)

16 In the figure, an observer is looking at the image of X in the mirror.



(a) Mark the position of the image.

(1 mark)

(b) Show on the diagram how a cone of rays from X enters the eye.

(2 marks)

END