KS3 SCIENCE · PHYSICS

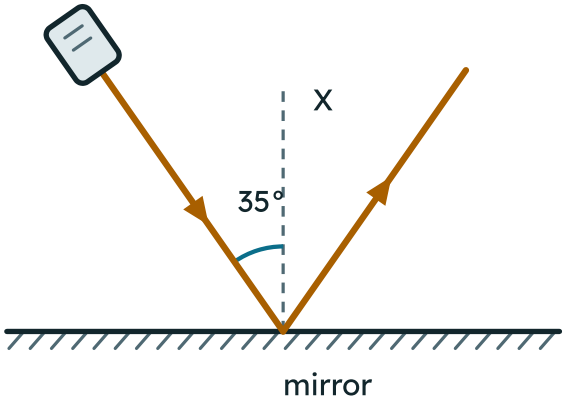
Light: exam questions

Name _____
Total: 22 marks

1 State the speed of light in a vacuum. Give the unit. **[1 mark]**

2 Give two differences between light waves and sound waves. **[2 marks]**

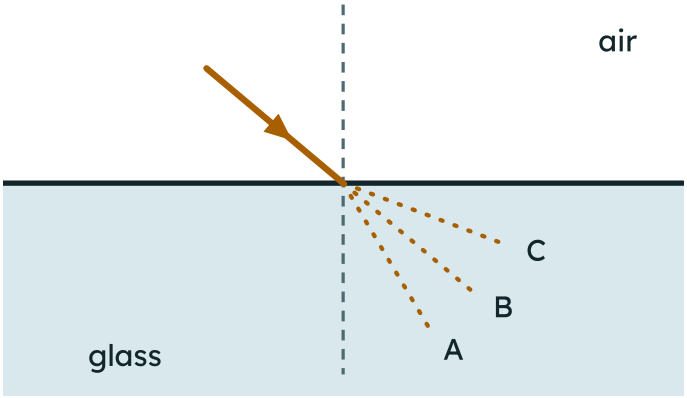
3 A ray of light from a ray box hits a flat mirror. **[2 marks]**



(a) Name the dashed line X.
(b) State the size of the angle of reflection.

4 A girl stands 1.5 m in front of a flat mirror. **[2 marks]**
(a) State how far behind the mirror her image seems to be.
(b) Give one other fact about her image.

5 A ray of light travels from air into a glass block. **[3 marks]**



(a) Which path does the ray take: A, B or C?
(b) Name this change of direction.
(c) Explain why the ray changes direction.

6 A swimming pool looks shallower than it really is. Explain why. **[2 marks]**

7 Describe how the eye forms an image, and how the brain gets information about it. **[3 marks]**

8 A ray of white light is shone through a glass prism. **[2 marks]**
(a) Describe what the prism does to the white light.
(b) Name the colour that is refracted the most.

9 A red book lies on a table. **[3 marks]**

(a) Explain why the book looks red in white light.

(b) The book is now lit only by blue light. State the colour it looks, and explain why.

10 You can see your face in a mirror, but not in a sheet of white paper. Both reflect light. **[2 marks]**

Explain the difference.

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Light: mark scheme

Total: 22 marks

1 [1 mark]

- 300 000 km/s (accept: 300 million m/s, or 300 000 000 m/s) **(1)**

2 [2 marks]

- Light can travel through a vacuum but sound cannot (accept: sound needs particles to carry it) **(1)**
- Light travels much faster than sound **(1)**
- Light is a transverse wave and sound is a longitudinal wave **(1)**

Any two of these three points, for 1 mark each.

3 [2 marks]

- (a) The normal **(1)**
- (b) 35° **(1)**

4 [2 marks]

- (a) 1.5 m **(1)**
- (b) Any one: it is the same size as her, it is the right way up, its left and right look swapped (accept: laterally inverted, or writing reads backwards), or it is a virtual image **(1)**

5 [3 marks]

- (a) A **(1)**
- (b) Refraction **(1)**
- (c) Light travels more slowly in glass than in air (accept: light slows down in glass, or glass is an optically denser medium than air) **(1)**

6 [2 marks]

- Light from the bottom of the pool is refracted as it leaves the water (accept: it changes direction, or it bends away from the normal) **(1)**
- So the light seems to come from a point above the real bottom (accept: the brain assumes that the light has travelled in a straight line) **(1)**

7 [3 marks]

- The cornea and the lens focus the light (accept: they refract the light, or the lens focuses the light) **(1)**
- The image forms on the retina **(1)**
- The retina sends electrical signals along the optic nerve to the brain **(1)**

8 [2 marks]

- (a) It splits it into a spectrum (accept: into its colours, or it disperses it) **(1)**
- (b) Violet **(1)**

9 [3 marks]

- (a) It reflects red light and absorbs the other colours **(1)**
- (b) It looks black **(1)**
- (b) It absorbs the blue light (accept: there is no red light for it to reflect) **(1)**

10 [2 marks]

- The mirror is smooth, so it reflects the rays evenly (accept: all at the same angle, in a regular way, or specular reflection) **(1)**
- The paper is rough, so it scatters the light in all directions (accept: diffuse scattering) **(1)**