

Multiple-choice test

Block 3: Supplement

Click on the correct answer to each question.

1 Waves are travelling across the surface of water. They have a frequency of 24 Hz and a wavelength of 1.5 cm. What is their speed, in m/s?

- A 0.16 m/s
- B 0.36 m/s
- C 16 m/s
- D 36 m/s

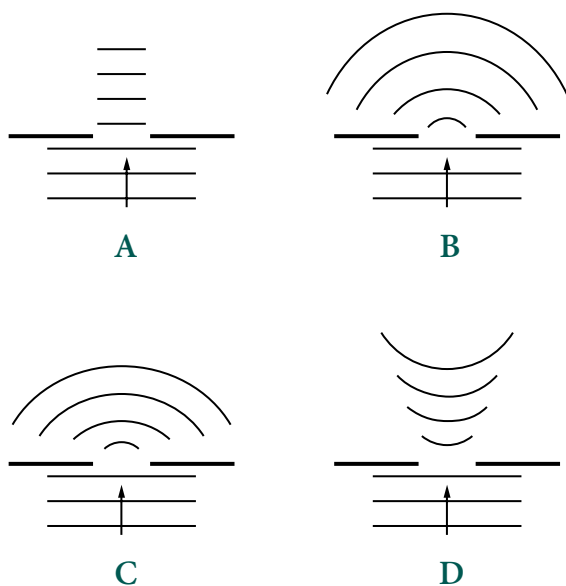
2 Light waves are refracted when they travel from air into glass. This is because their speed decreases. Which row in the table shows correctly how the frequency and wavelength of the light waves change when the light is refracted?

	Frequency	Wavelength
A	increases	decreases
B	unchanged	decreases
C	unchanged	increases
D	decreases	unchanged

3 Diffraction occurs when a wave . . .

- A . . . strikes a solid surface.
- B . . . passes through a narrow gap.
- C . . . changes its speed.
- D . . . changes its wavelength

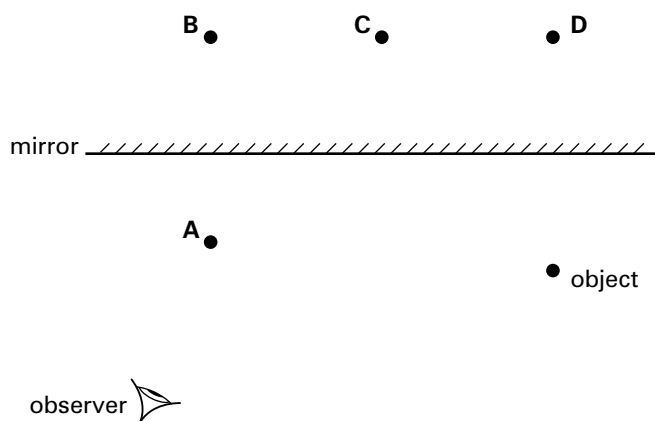
4 Which diagram shows correctly the diffraction of wavefronts as they pass through a gap?



5 Which row in the table shows correctly the characteristics of the image formed by a plane mirror?

	Size	Position	Type
A	smaller than object	behind mirror	virtual
B	smaller than object	behind mirror	real
C	same as object	in front of mirror	real
D	same as object	behind mirror	virtual

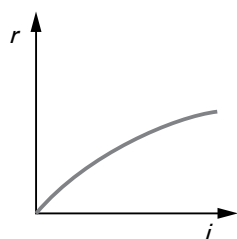
6 Which point in the diagram shows the approximate position of the image of the object formed by the mirror?



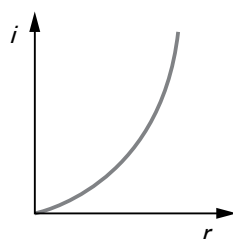
7 Opticians supply lenses made of different types of plastic; each type has a different refractive index. The table shows the refractive indices of four types of plastic. In which type of plastic does light travel at the highest speed?

Type of plastic	Refractive index
A	1.48
B	1.67
C	1.52
D	1.49

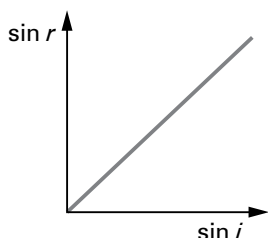
8 The refractive index of a material can be deduced from measurements of the angle of incidence i and the angle of refraction r . The four graphs show how i and r are related. Which graph has a gradient equal to the refractive index?



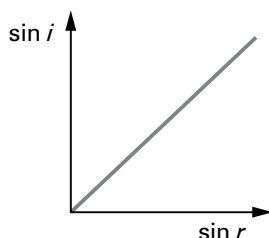
A



B



C

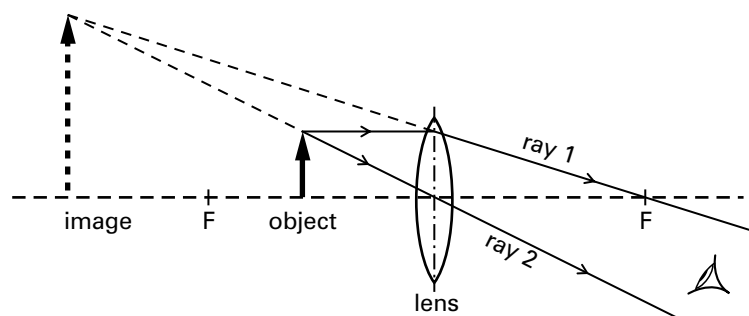


D

9 The critical angle of a material is related to its refractive index. What is the critical angle in degrees for glass of refractive index 1.55?

- A 0.011 degrees
- B 37.0 degrees
- C 40.2 degrees
- D 49.8 degrees

- 10 The ray diagram shows how an image is formed when a converging lens is used as a magnifying glass. Which of the following statements is **not** correct?



- A The image is larger than the object.
B The image is a virtual image.
C The image is inverted (upside down).
D The image is further from the lens than the object.
- 11 A laser produces light that is described as monochromatic. Which of the following statements about the laser light is **not** correct?
- A The light has a single frequency.
B The light travels at 3.0×10^8 cm/s in a vacuum.
C The light travels at approximately the same speed in air as in a vacuum.
D The light cannot be dispersed into different wavelengths by a prism.
- 12 A sound wave travels through a material as a series of compressions and rarefactions. Which of the following statements about a sound wave is correct?
- A The particles of the material travel through the material at the speed of sound.
B The wavelength of a sound wave is the distance from a rarefaction to a compression.
C The particles of the material are closer together in a rarefaction than in a compression.
D Compressions and rarefactions travel through the material at the speed of sound.