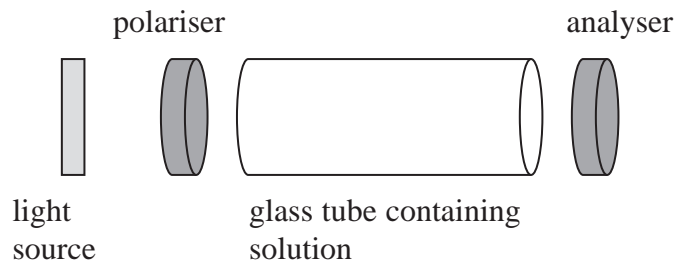


- 1 Polarimeters are used to measure the degree of rotation of the plane of polarisation by solutions.

The diagram represents the parts of a polarimeter. The polariser and analyser are both polarising filters.



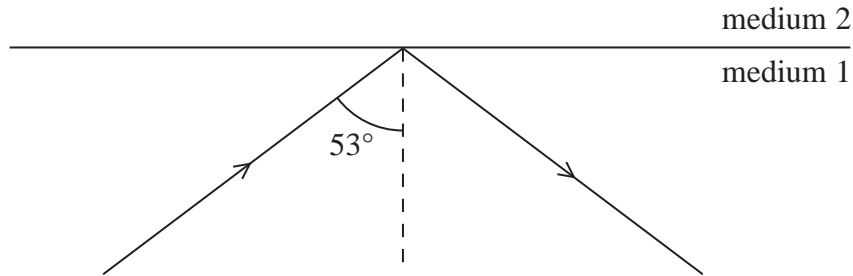
An experiment led to the conclusion that the solution had rotated the plane of polarisation of the light by  $35^\circ$ .

Which of the following rotations of the plane of polarisation could also have been a correct conclusion?

- A  $55^\circ$
- B  $125^\circ$
- C  $215^\circ$
- D  $305^\circ$

**(Total for Question = 1 mark)**

- 2 Light in medium 1 strikes a boundary with medium 2 which is also transparent. The diagram shows what happens.

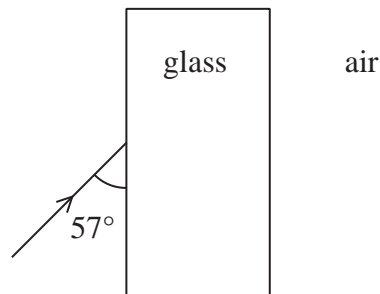


Which of the following can be deduced?

- A The critical angle for light travelling from medium 1 into medium 2 is  $53^\circ$ .
- B The refractive index of medium 1 is greater than the refractive index of medium 2.
- C The speed of light in medium 1 is greater than the speed of light in medium 2.
- D The frequency of light in medium 1 is less than the frequency of light in medium 2.

(Total for Question = 1 mark)

- 3 The diagram shows a ray of light incident upon the surface of a glass block.

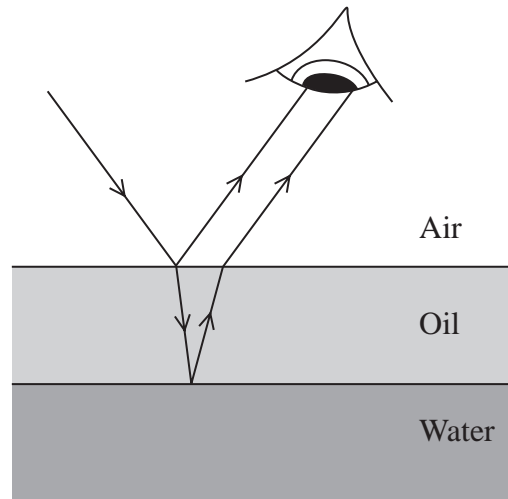


Which line could correctly show the angle of incidence and the angle of refraction?

	Angle of incidence	Angle of refraction
<input type="checkbox"/> A	$33^\circ$	$21^\circ$
<input type="checkbox"/> B	$33^\circ$	$55^\circ$
<input type="checkbox"/> C	$57^\circ$	$34^\circ$
<input type="checkbox"/> D	$57^\circ$	$38^\circ$

(Total for Question = 1 mark)

- 4 The diagram shows a ray of white light striking a thin layer of oil on water. Light reflects from the upper and lower surfaces of the oil, so that two rays reach the eye of an observer. With the eye in different positions the observer sees different colours from the oil.

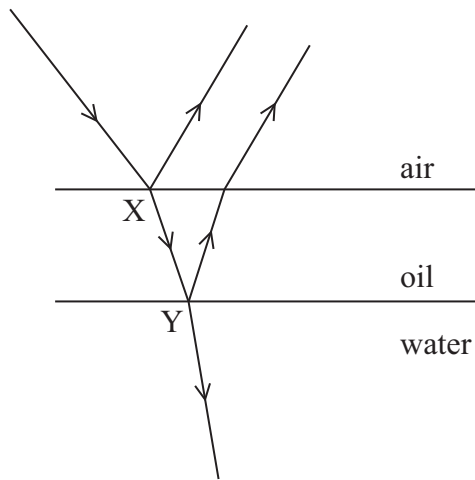


Which of the following phenomena is not involved in the production of the colours seen?

- A polarisation
- B reflection
- C refraction
- D superposition

(Total for Question = 1 mark)

- 5 A ray of light is incident on a thin film of oil on water. Some of the light is reflected at X and some at Y.

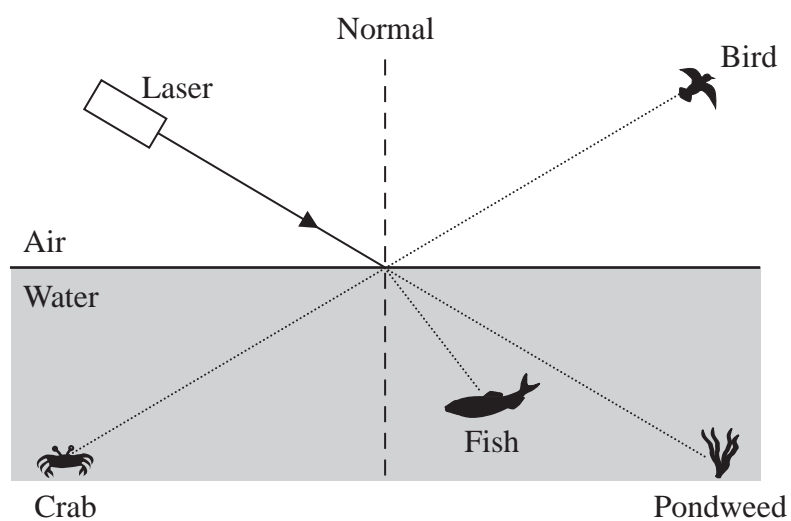


The two reflected rays will be  $180^\circ$  out of phase if the path difference is

- A an odd number of wavelengths.
- B an even number of wavelengths.
- C an odd number of half wavelengths.
- D an even number of half wavelengths.

(Total for Question 1 mark)

6 A laser beam is directed at the surface of a smooth, calm pond as shown in the diagram.

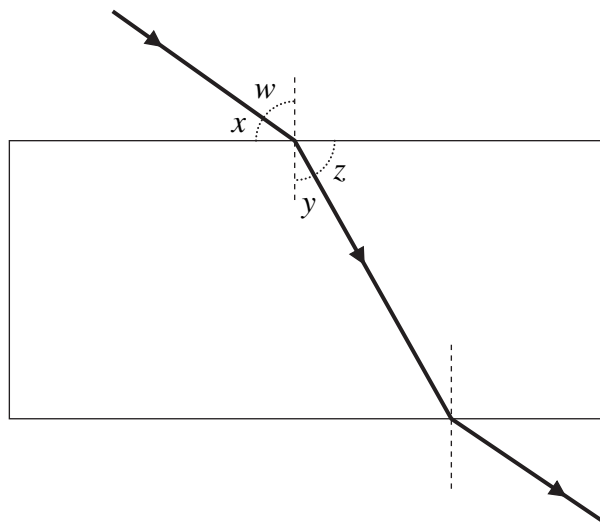


Which organisms could be illuminated by the laser light?

- A The bird and the fish.
- B The crab and the pondweed.
- C The bird and the pondweed.
- D The crab and the fish.

(Total for Question = 1 mark)

- 7 The refractive index of glass can be found by tracing a ray of light through a block of glass and measuring angles.

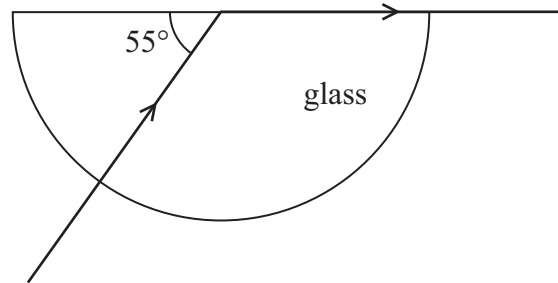


Which of the following expressions is equal to the refractive index of glass?

- A  $\frac{\sin w}{\sin y}$
- B  $\frac{\sin y}{\sin w}$
- C  $\frac{\sin x}{\sin z}$
- D  $\frac{\sin z}{\sin x}$

(Total for Question = 1 mark)

8 A ray of monochromatic light passes into a glass block as shown.

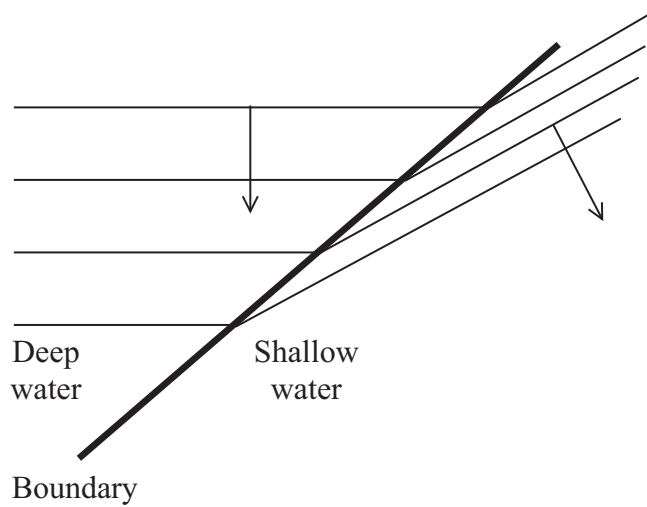


The refractive index of the glass for this light is

- A 0.57
- B 0.81
- C 1.22
- D 1.74

(Total for Question 1 mark)

- 9 The diagram represents straight wavefronts passing across a boundary from deep water into shallow water, with a change in speed and direction.



Which wave property does this diagram illustrate?

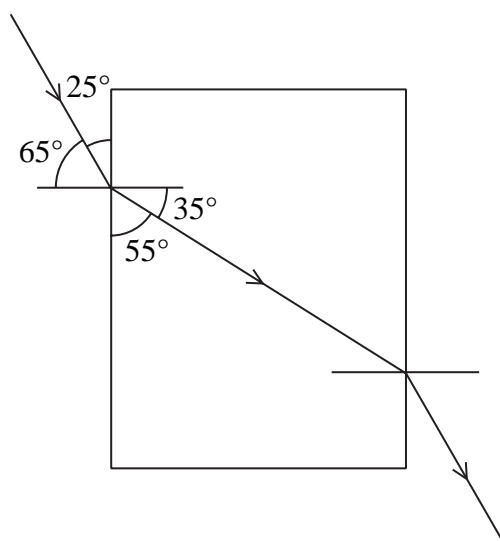
- A diffraction
- B interference
- C reflection
- D refraction

(Total for Question 1 mark)



Use the diagram below for questions 10 and 11.

The diagram shows a ray of light passing through a rectangular glass block.



10 Which row in the table below correctly identifies the changes to the properties of the light as it enters the glass block?

		Frequency	Velocity	Wavelength
<input type="checkbox"/>	A	no change	decreases	decreases
<input type="checkbox"/>	B	no change	increases	increases
<input type="checkbox"/>	C	increases	increases	no change
<input type="checkbox"/>	D	increases	no change	decreases

(Total for Question = 1 mark)

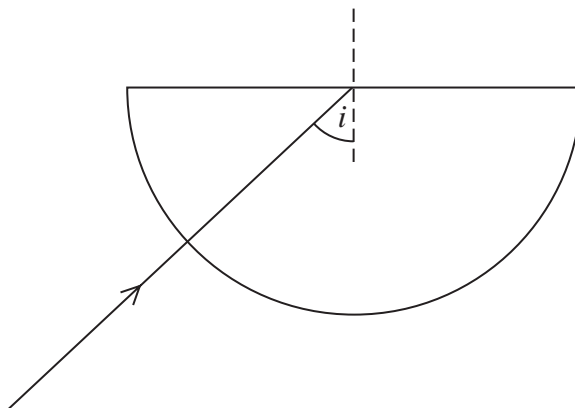
11 The refractive index of the glass is

- A 0.52
- B 0.63
- C 1.6
- D 1.9

(Total for Question = 1 mark)

12 Light travels into a semicircular glass block as shown in the diagram. The ray of light reaches the straight edge of the block at an angle of incidence  $i$ .

The critical angle for glass is  $c$ .



Which one of the following statements is true for light at the straight edge?

- A When  $i$  is bigger than  $c$  then no light is reflected.
- B When  $i$  is bigger than  $c$  then no light is transmitted.
- C When  $i$  is smaller than  $c$  then no light is reflected.
- D When  $i$  is smaller than  $c$  then no light is transmitted.

(Total for Question = 1 mark)