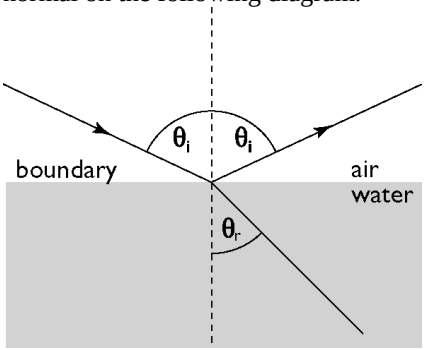
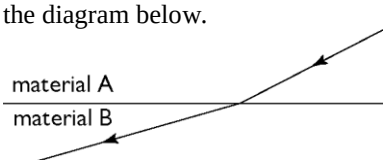
Refraction Worksheet

Question 1
Label the angle of incidence, angle of refraction and the normal on the following diagram.



Questions 2 to 3 refer to the following information.
Light passes from material A into material B, as shown in the diagram below.



Question 2
Calculate the relative refractive index for light passing from material A to material B if the angle of incidence is 30º and the angle of refraction is 40º.

Question 3
What is the relative refractive index for light passing from material A to material B if the angle of incidence is 14.32º? Justify your answer.

Question 4
The refractive indices for crown glass and alcohol are 1.52 and 1.36 respectively.
A ray of light passes from alcohol to crown glass. If the angle of incidence is 50º, calculate the angle of refraction.

Question 5
The refractive index of water is 1.33. Calculate the speed of light in water given that the speed of light in a vacuum is 3.00×10^8 m s^{-1}.

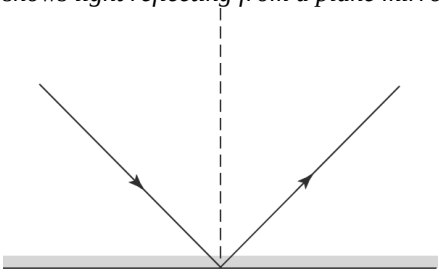
Question 6
The speed of light in perspex is 2.0×10^8 m s^{-1}. Calculate the refractive index of perspex, given that the speed of light in a vacuum is 3.00×10^8 m s^{-1}.

Questions 7 and 8 refer to the following information.
The refractive index of diamond is 2.42 and the refractive index of air is 1.00.

Question 7
Calculate the critical angle for light passing from diamond into air.

Question 8
Describe what happens to light at the diamond–air interface when the angle of incidence is greater than the critical angle.

Questions 1 and 2 refer to the following diagram. It shows light reflecting from a plane mirror.

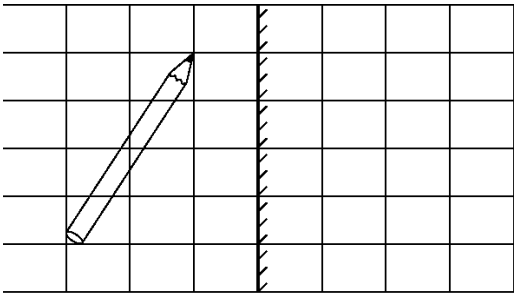


Question 1
On the diagram, mark in
(a) the incident ray
(b) the normal to the surface
(c) the angle of incidence
(d) the angle of reflection

Question 2
If the angle of incidence is 37º, what is the angle of reflection?

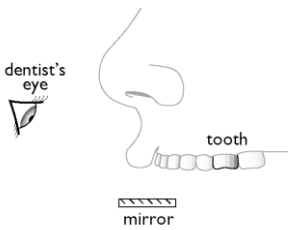
Question 3
Explain the difference between regular and diffuse reflection.

The following diagram shows a pencil in front of a plane mirror.



Question 4
Mark in the position of the image on the diagram.

A dentist uses a small plane mirror to look at a patient's tooth. She places the mirror in the position shown in the diagram below. The position of the dentist's eye is also shown.



Question 5
Will the dentist be able to see an image of the tooth with the mirror in the position shown? Justify your answer by using a ray tracing diagram.