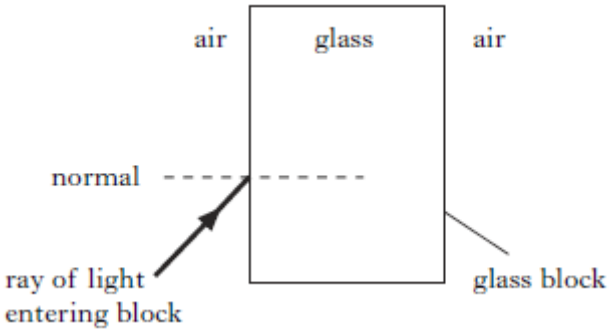
Light Questions – NAT 5

1) What is meant by the term refraction?

2) A ray of light enters a glass block as shown in the diagram below.

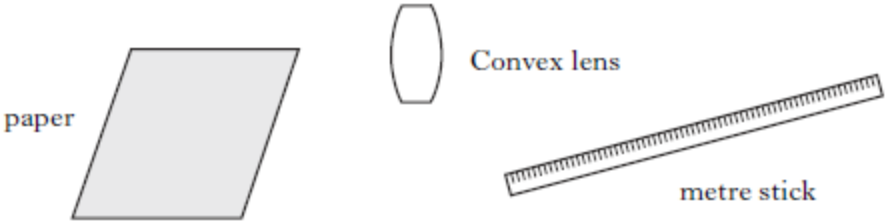


a) Complete the diagram below to show the path of the ray of light going through and after it emerges from the glass block.

b) i) On your diagram draw in the angle of refraction(**r**).
ii) Which angle is the greatest, **i** or **r**?

c) What is noticeable about the rays entering and leaving the glass block?

3) A Physics student wants to find out the focal length of a convex lens.
a) Explain how the student could carry out an experiment using the equipment below to find the focal length.



b) What three differences does the student notice when comparing the image on the screen with the object being viewed?

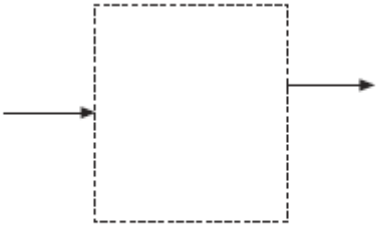
c) If a thinner convex lens is used, then how will its focal length compare to that of the original thicker convex lens?

4) A group of Physics students investigate the effects of the following shapes of Perspex block on rays of white light.

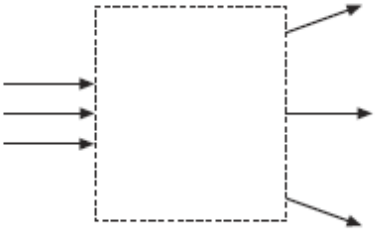
The teacher sets up the three experiments by covering the Perspex shapes with a piece of card.

Draw the **shape** and **position** of the Perspex shapes for each of the three experiments **on the card** in each diagram.

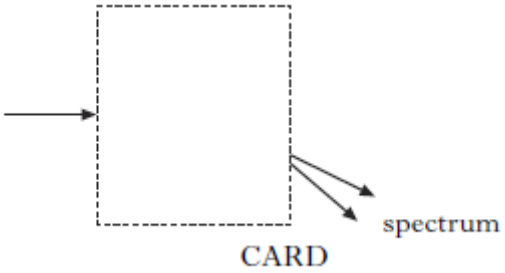
a)



b)



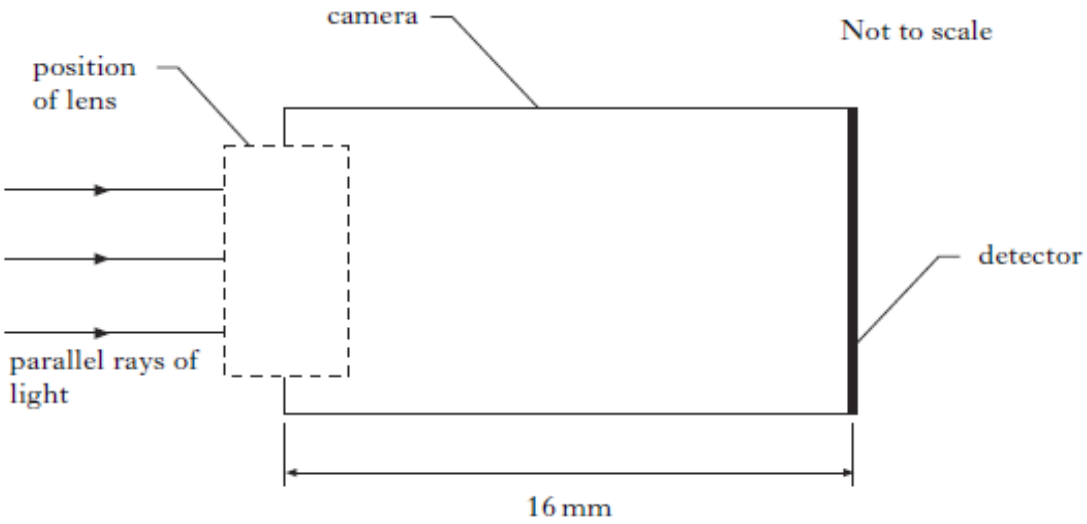
c)



5) A door entry system to an exclusive block of flats allows the flat owner to have audio and video information on the person trying to gain access.

A camera uses a lens at the entrance to focus parallel rays of light on to a detector.

Part of the camera is shown below.



Complete the diagram by:

a) Drawing the lens used.

b) Drawing the path of the rays of light to the detector **with a ruler**.

6) The passage of light through the eye until an image is formed can be summed up by the mnemonic **CPLROB**.

a) What do each of these letters stand for?

b) Why is the Iris of the eye not mentioned in the mnemonic above?

c) What is the screen of the eye called?

d) In which two parts of the eye will refraction take place?

7) Figure 1 shows the rays of light from the screen entering the eye of a person until the rays reach the retina.

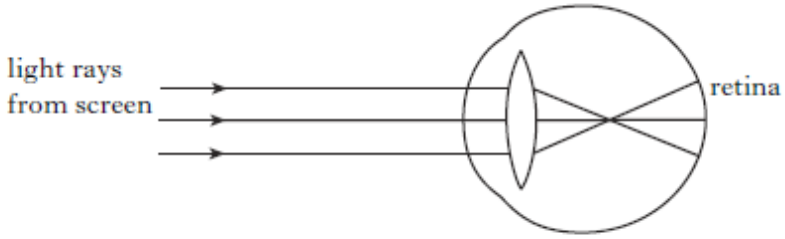


Figure 1

a) In the dotted box in Figure 2 draw the shape of the lens that would correct this eye defect.

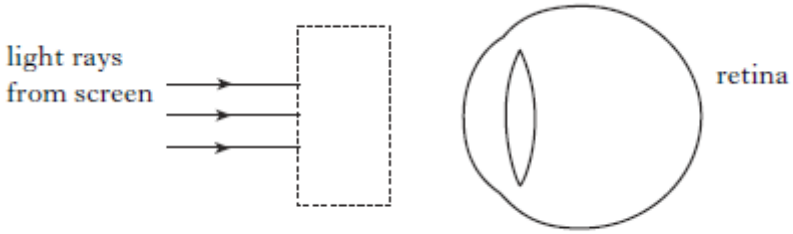


Figure 2

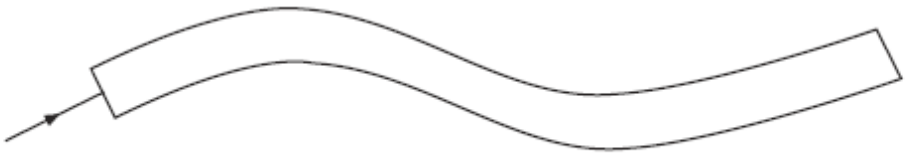
b) Complete the path of the rays of light from the lens until they reach the retina.

c) Is this eye defect short sight or long sight?

d) McMullen lives in a cave because he is short sighted.

What does this mean? (No Airdrie jokes please!!!)

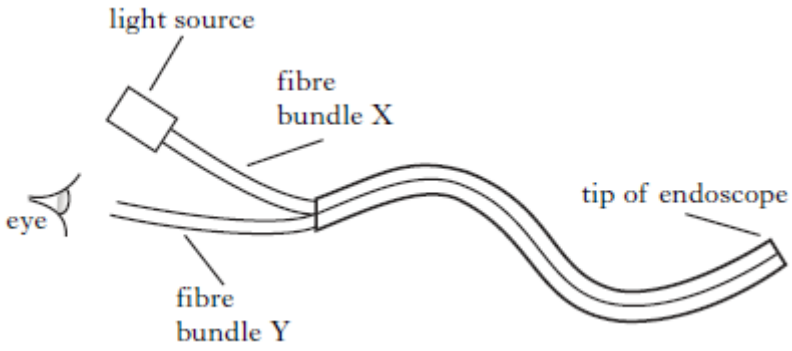
8) A section of an optical fibre is shown below.



a) Complete the diagram to show how light is transmitted through the optical fibre.

b) Why is the light referred to as ‘cold light’?

9) Doctors use endoscopes (fibrescopes or gastroscopes) to examine the internal organs of a patient. The endoscope consists of two bundles of optical fibres X and Y.



a) What is the name of each of these bundles of optical fibres X and Y?

b) What is the purpose of each of these bundles of optical fibres?

c) Suggest a reason why the tip of the endoscope is flexible.

10) Submariners use periscopes while they are submersed under the sea to view objects on the water surface.

a) What application of Physics is used with periscopes?

b) Draw a labelled sketch which shows the passage of light through a periscope.