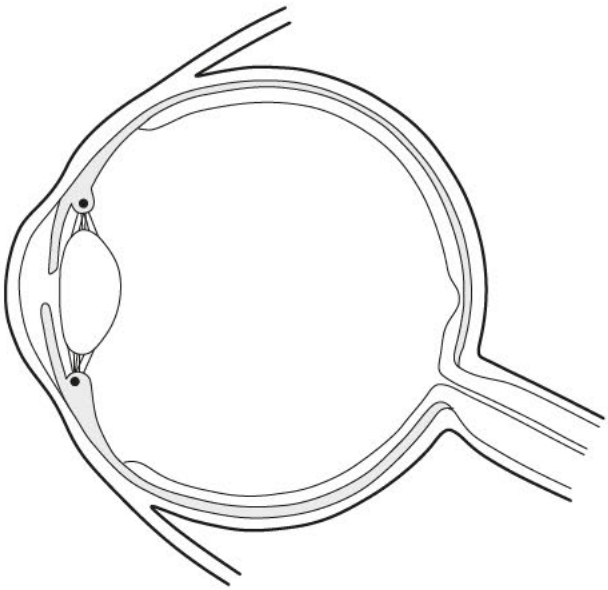
1 This question is about vision.

Look at the diagram of an eye.



(a) Draw straight lines to join each **part of the eye** to its **job**.

One has been done for you.

Part of eye	Job
cornea	carries impulses to the brain
iris	contains light receptors
optic nerve	controls amount of light entering eye
retina	refracts light

[2]

(b) As people get older, the lens in the eye becomes less flexible and cannot change shape easily.

This means they cannot focus clearly on near objects.

Explain why.

.....

.....

..... **[2]**

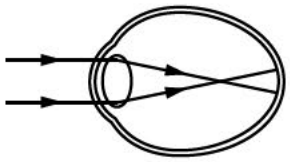
2 Kevin and Jeanette have different eyesight problems.

Look at the diagram.

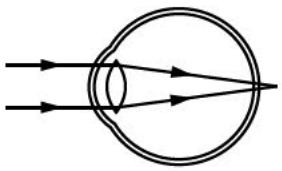
It shows how light is focused in each of their eyes.

how light is focused in eye

Kevin



Jeanette



Kevin and Jeanette both wear glasses.

Jeanette wants to have corneal surgery to correct her eyesight.

Kevin is not sure if he wants corneal surgery.

Explain why Kevin and Jeanette need to wear glasses and suggest reasons for and against having corneal surgery.

The quality of written communication will be assessed in your answer to this question.

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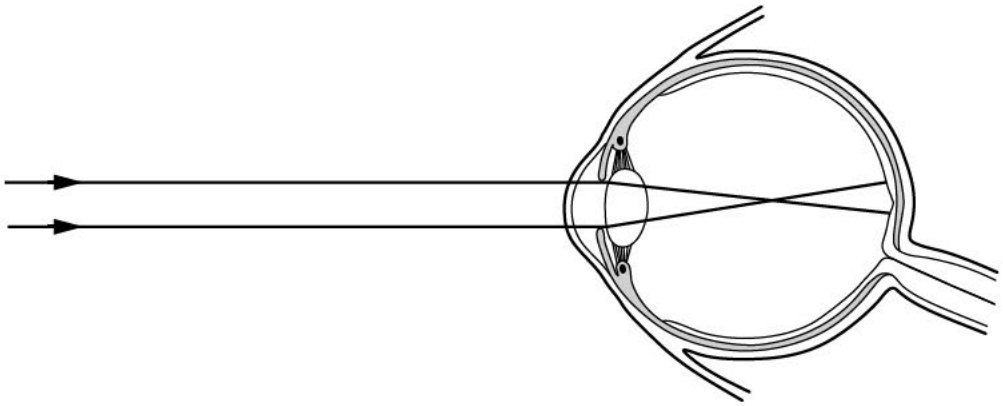
.....

.....

..... **[6]**

[Total: 6]

3 **(a** The diagram shows an eye of a short-sighted person looking at a distant object.



(i) Explain how the lens being the wrong shape can cause **short**-sight.

.....

.....

..... **[2]**

(ii) Short-sight can be corrected by wearing glasses.

Write down the type of lens used in these glasses.

..... **[1]**

(b) Scientists have found a rare genetic disorder that can cause short-sight.

It is called nanophthalmos.

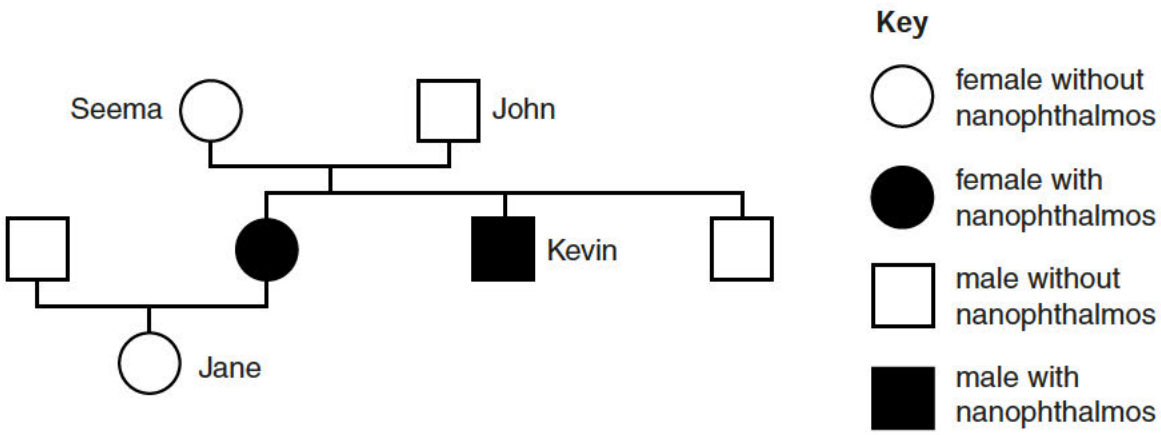
This is caused by a recessive allele.

(i) What is an allele?

.....

..... **[1]**

(ii) Look at this part of a family tree showing some people with nanophthalmos.



Nanophthalmos is caused by a recessive allele.

How can you tell this from this family tree?

.....

.....

..... **[2]**

(iii) Jane is a carrier of nanophthalmos.

Jane marries Simon who has nanophthalmos.

What is the probability of their first child having the disorder?

You must draw a genetic diagram to work out your answer.

(Use **N** for the allele for normal vision and **n** for the allele for nanophthalmos.)

probability = ... % **[3]**

[Total: 9]