

4 Mitosis and meiosis are both forms of nuclear division. Mitosis can be observed in root tip squashes from a plant such as garlic.

(a) Place a cross ☐ in the box next to the correct word or words to complete each of the following statements.

(i) The stain used in a root tip squash can be intensified by

(1)

- ☐ **A** adding acid
- ☐ **B** adding alkali
- ☐ **C** gently heating
- ☐ **D** squashing the tip

(ii) Mitosis occurs in

(1)

- ☐ **A** plant fibres
- ☐ **B** sclerenchyma fibres
- ☐ **C** stem cells
- ☐ **D** xylem vessels

(b) Describe the appearance of a cell in telophase of mitosis as seen in a root tip squash.

(3)

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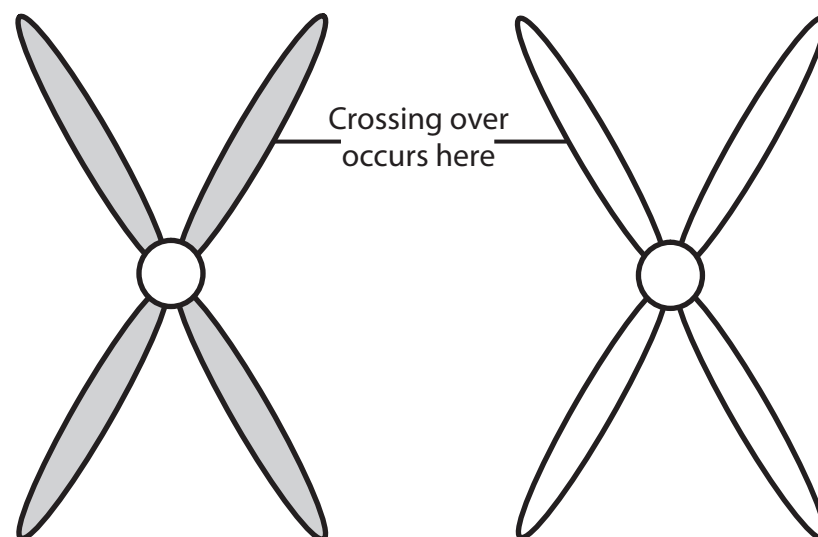
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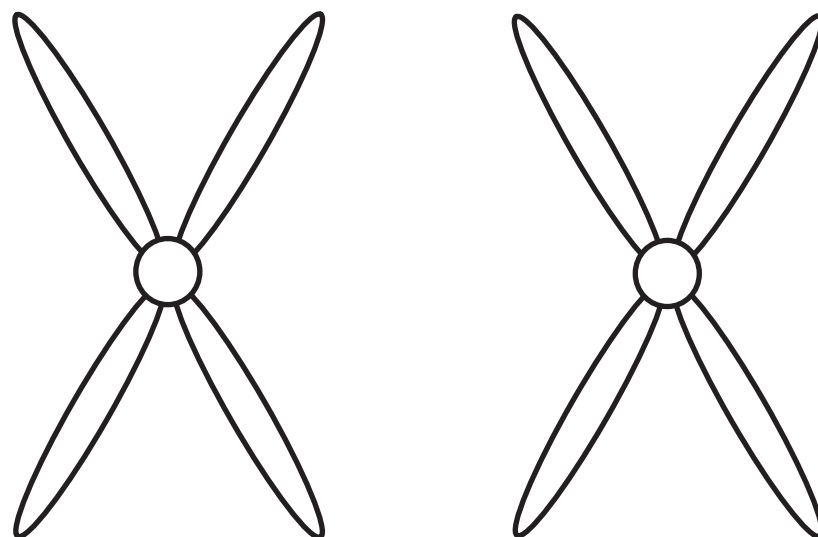
(c) One way in which meiosis increases genetic variation is through crossing over.

- (i) The diagram below shows a pair of homologous chromosomes during meiosis. They are positioned next to each other but crossing over has not yet occurred.



Complete the diagram below to show these chromosomes after crossing over has occurred.

(1)



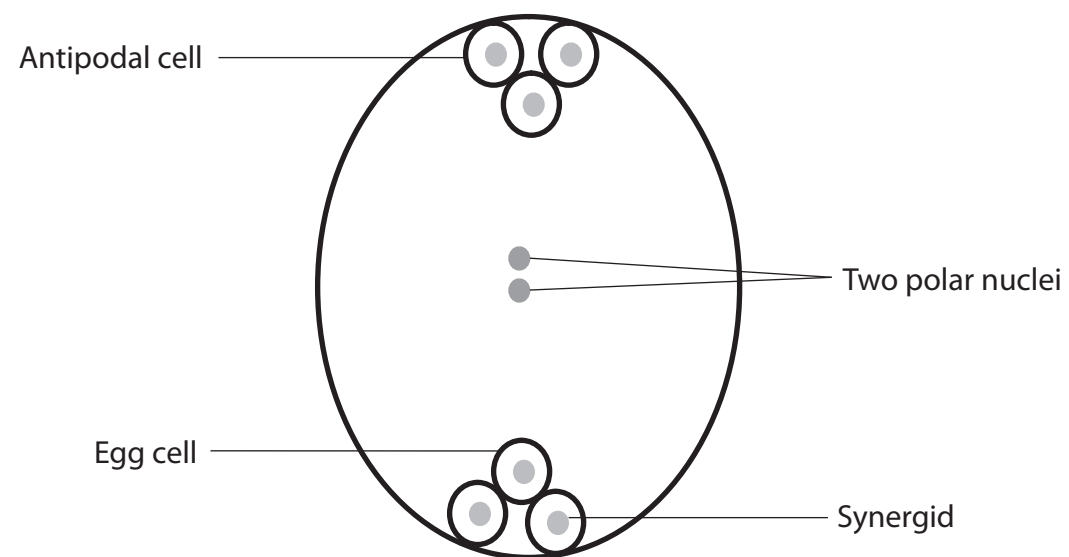
P 3 8 1 7 2 A 0 1 3 2 8

(ii) Meiosis produces haploid structures in the plant.

The diagram below shows an embryo sac.

Draw a circle round each of the labels of **two** haploid structures that are fertilised in the embryo sac.

(2)



(iii) Explain what is meant by the term **haploid number** of chromosomes.

(1)

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(Total for Question 4 = 9 marks)

