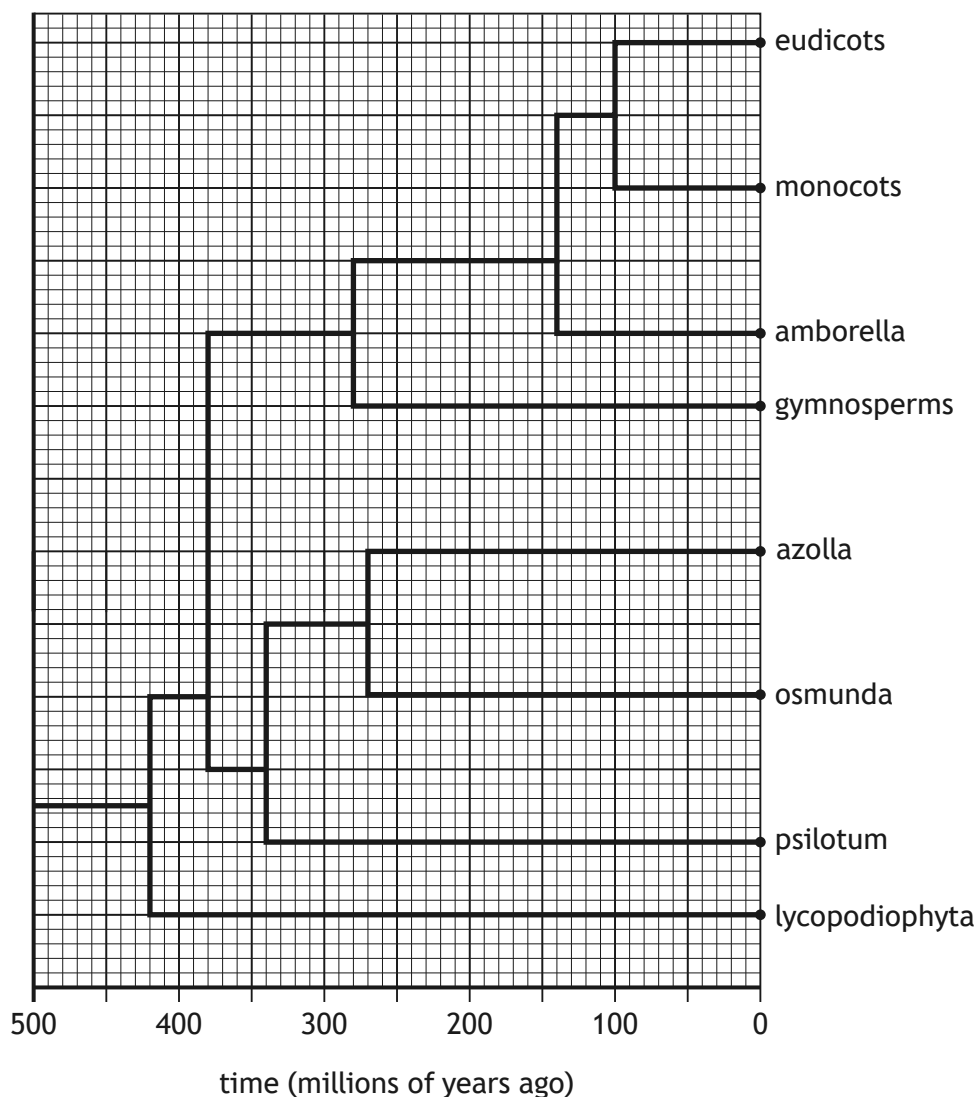


4. The phylogenetic tree shown illustrates the evolutionary relatedness of eight groups of land plants.



- (a) (i) Phylogenetics uses fossil evidence to study evolutionary relatedness. Name another type of evidence required to construct a phylogenetic tree. 1
- (ii) Using information from the diagram state when the last common ancestor of amborella and osmunda lived. 1
- _____ millions of years ago
- (iii) State how many groups of land plants monocots shared a common ancestor with 200 million years ago. 1
- _____

4. (a) (continued)

- (iv) Monocots are more closely related to gymnosperms than to lycopodiophyta.

Use information from the diagram to justify this statement.

1

- (b) The ACS gene is found in the eudicot plant group genome. Several different enzymes can be expressed from this gene.

- (i) State the definition of a genome.

1

- (ii) In terms of gene expression, describe how different enzymes can be produced from a single ACS gene.

2

[Turn over

