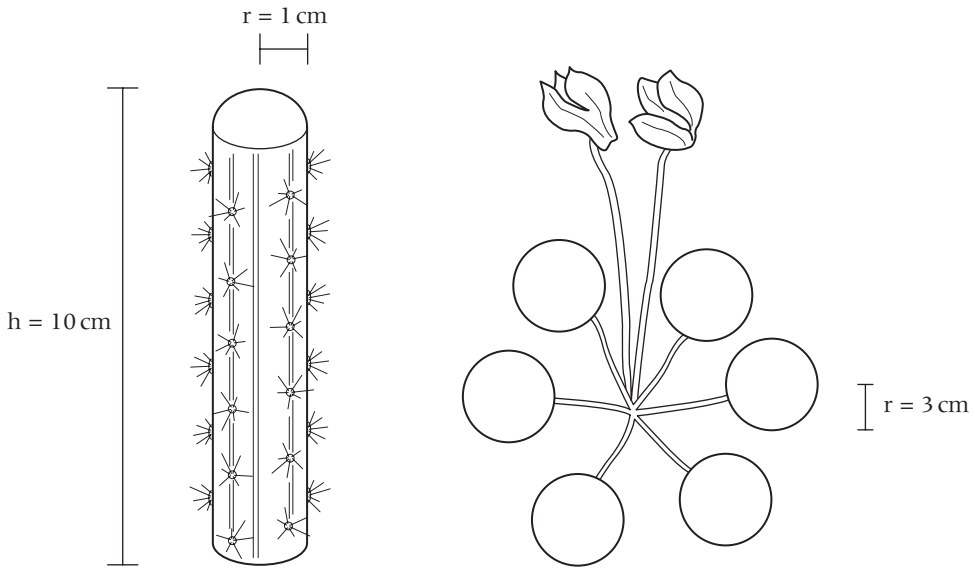
7Cb/7 Plants and their adaptations

The diagrams show two plants – a cactus and a cyclamen. Both plants are 10 cm tall.



Cactus Cyclamen

1 Which part of each plant carries out photosynthesis?

2 Assuming that the cactus is a cylinder, work out its surface area. The formula you need is:

surface area = $2\pi rh + \pi r^2$

h = height, r = radius and $\pi = 3.14$.

Show your working. Give your answer to two significant figures.

3 Assuming that the cyclamen leaves are perfectly round, work out their combined surface area. The formula you need for the top surface of one leaf is:

surface area = πr^2

Show your working. Give your answer to two significant figures.

4 Use your calculations to try to explain why a cactus grows so slowly.

5 Suggest why not all of the surface area that you calculated for the cactus can be used for photosynthesis at the same time.

6 Estimate the surface area of the cactus that can be used for photosynthesis at any one time.

7 Design a formula to calculate the amount of a cactus stem that may have sunlight at any one time.

8 Explain, with reasons, why a cyclamen plant would not last very long in the desert.

knowledge, numeracy