

2 **M1** is a slide of a stained transverse section through a plant stem.

(ii) Observe the xylem vessel elements in the stem on **M1**.

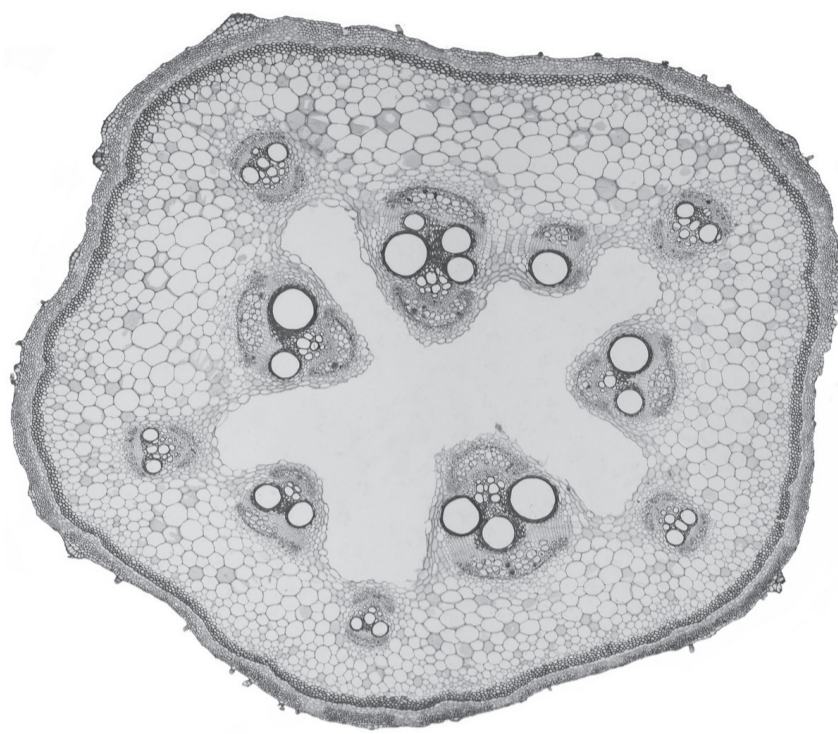
Select a group of **four** adjacent xylem vessel elements.

Each xylem vessel element must touch at least **one** other xylem vessel element.

- Make a large drawing of this group of **four** xylem vessel elements.
- Use **one** ruled label line and label to identify the wall of **one** xylem vessel element.

[5]

(b) Fig. 2.2 is a photomicrograph of a stained transverse section of a stem from a different plant to **M1**.



**Fig. 2.2**

Identify **three** observable differences, other than colour, between the stem section on **M1** and the stem section in Fig. 2.2.

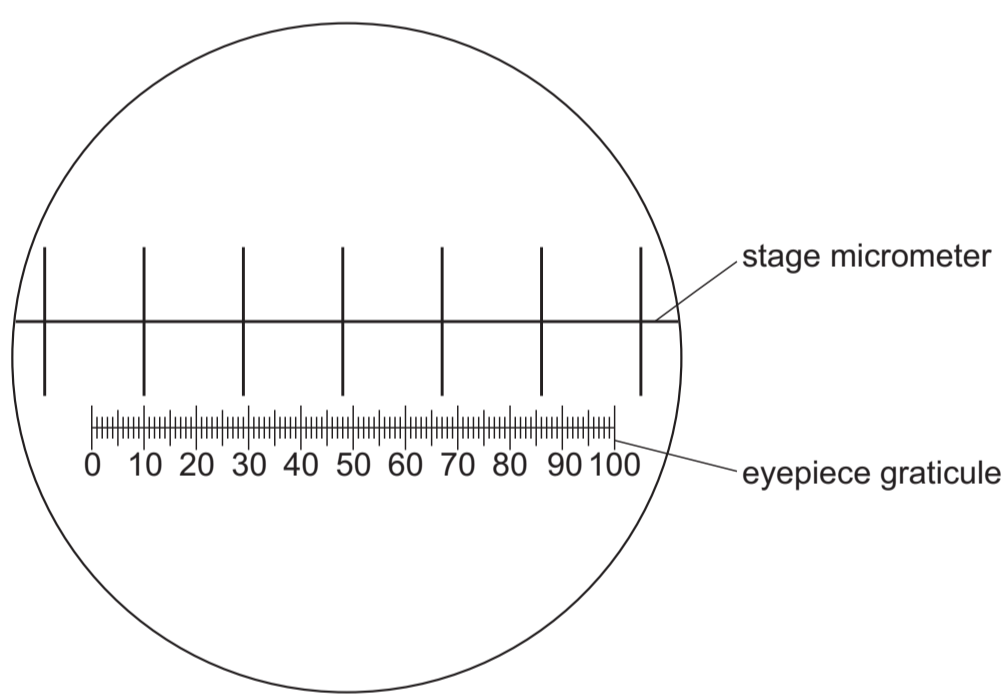
Record these **three** observable differences in an appropriate table.

[4]

(c) Fig. 2.3 shows a photomicrograph of a stage micrometer scale that is being used to calibrate an eyepiece graticule.

One division, on either the stage micrometer scale or the eyepiece graticule, is the distance between two adjacent lines.

The length of one division on the stage micrometer in Fig. 2.3 is 1.0 mm.



**Fig. 2.3**

(i) Calculate the actual length of one eyepiece graticule unit shown in Fig. 2.3.

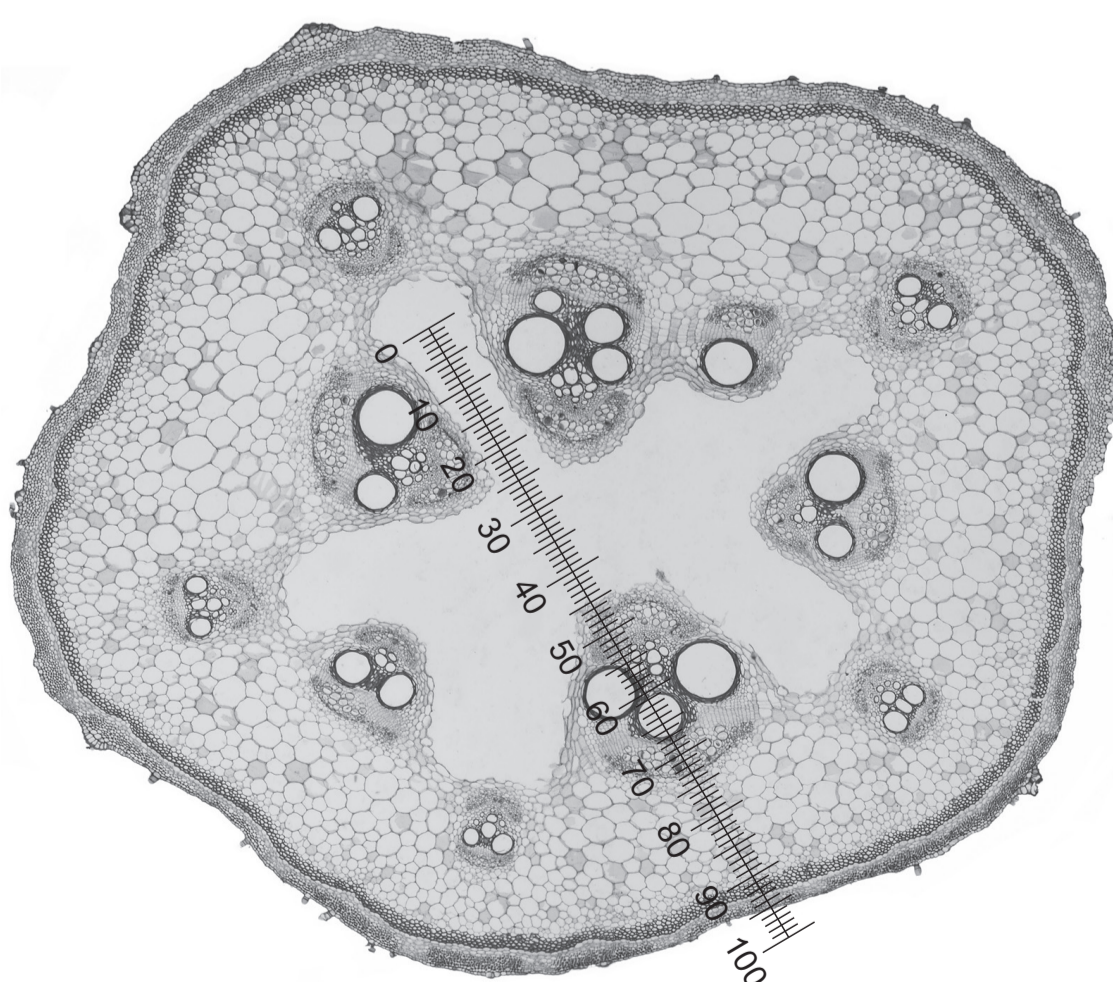
Give your answer in micrometres ( $\mu\text{m}$ ).

Show your working and give your answer to **three** significant figures.

actual length of one eyepiece graticule unit = .....  $\mu\text{m}$   
[3]

(ii) Fig. 2.4 is the same photomicrograph as that shown in Fig. 2.2. This was taken with the same microscope and the same lenses used to take the photomicrograph in Fig. 2.3.

The eyepiece graticule has been placed across the length of a vascular bundle.



**Fig. 2.4**

Use the calibration of the eyepiece graticule unit from (c)(i) to calculate the actual length of the vascular bundle in Fig. 2.4.

Show your working and use appropriate units.

actual length of the vascular bundle = .....  
[2]

[Total: 19]