

2 (a) A student used DCPIP solution to compare the concentration of vitamin C in five solutions.

The student used this method:

- Put 1 cm<sup>3</sup> of 1% DCPIP solution into a test-tube.
- Use a syringe to add drops of 125 mg per dm<sup>3</sup> vitamin C solution to the test-tube.
- Keep adding drops of vitamin C solution until the DCPIP solution becomes colourless.
- Record the total volume of the 125 mg per dm<sup>3</sup> vitamin C solution added.

This method was repeated with four other concentrations of vitamin C solution.

(i) State the expected colour of the DCPIP solution **before** the vitamin C solution was added.

..... [1]

(ii) State **two** variables that were kept constant by the student in this investigation.

1 .....

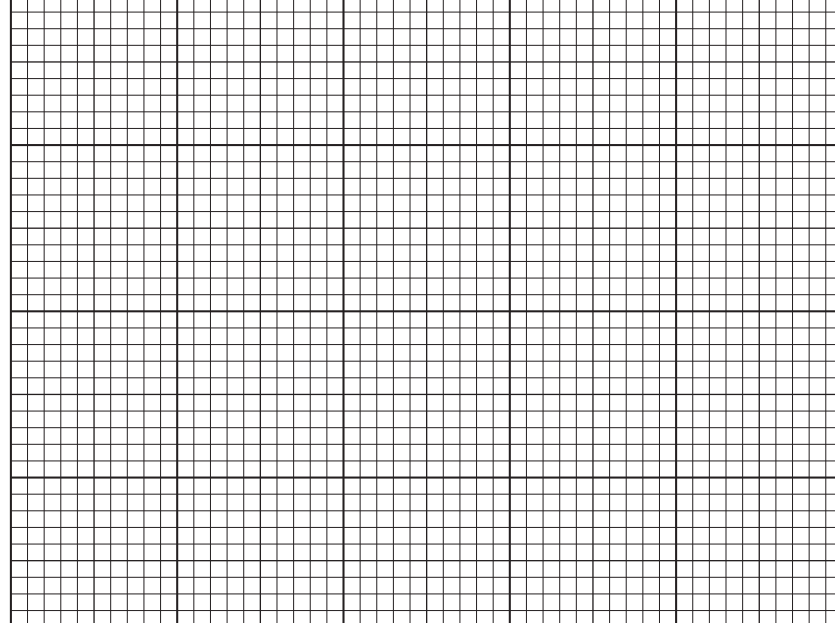
2 ..... [2]

The results of the investigation are shown in Table 2.1.

**Table 2.1**

concentration of vitamin C / mg per dm <sup>3</sup>	total volume of vitamin C solution added / cm <sup>3</sup>
125	1.6
250	1.4
500	1.1
750	0.8
1000	0.5

(b) (i) Plot a line graph on the grid of the data in Table 2.1.



[4]

(ii) The student tested a sample of orange juice.

They found that 1.2 cm<sup>3</sup> of orange juice was needed to react with 1 cm<sup>3</sup> of 1% DCPIP solution.

Use your graph to estimate the vitamin C concentration of the orange juice.

Show on the graph how you obtained your estimate.

..... mg per dm<sup>3</sup>

[2]

(c) The student wanted to investigate the effect of storage on the vitamin C concentration in apple juice.

Three samples of fresh apple juice and three samples of stored apple juice were tested.

The results are shown in Table 2.2.

**Table 2.2**

sample	concentration of vitamin C in fresh apple juice / mg per dm <sup>3</sup>	concentration of vitamin C in stored apple juice / mg per dm <sup>3</sup>
1	281	170
2	276	96
3	272	104

(i) State a conclusion for the data shown in Table 2.2.

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..... [1]

(ii) The student decided that the result of one sample shown in Table 2.2 was anomalous.

State what is meant by an anomalous result.

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..... [1]

(iii) Draw a circle around the anomalous result in Table 2.2. [1]

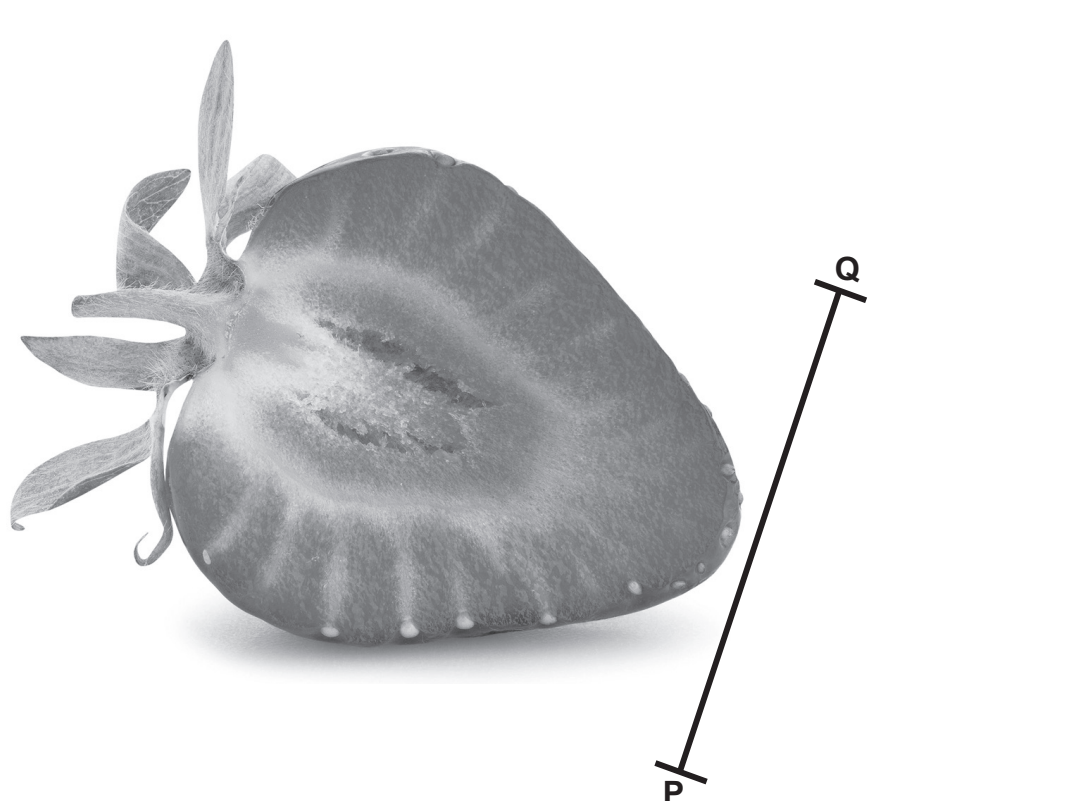
(iv) Using the data for **sample 3** in Table 2.2, calculate the percentage change in the vitamin C concentration of the apple juice when it is stored.

Give your answer to **one** decimal place.

Space for working.

..... % [3]

(d) Fig. 2.1 is a photograph of a fruit from a strawberry plant, *Fragaria ananassa*, that has been cut in half.



**Fig. 2.1**

(i) Draw a large diagram of the strawberry fruit shown in Fig. 2.1.

[4]

(ii) Line **PQ** in Fig. 2.1 represents the maximum diameter of the strawberry fruit.

Measure the length of line **PQ** in Fig. 2.1.

length of **PQ** ..... mm

Calculate the actual diameter of the strawberry fruit using the formula and your measurement.

$$\text{magnification} = \frac{\text{length of line PQ in Fig. 2.1}}{\text{actual diameter of the strawberry fruit}}$$

Give your answer to **three** significant figures.

Space for working.

..... mm

[3]

(e) Describe a method the student could use to test a strawberry fruit for reducing sugars.

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..... [2]