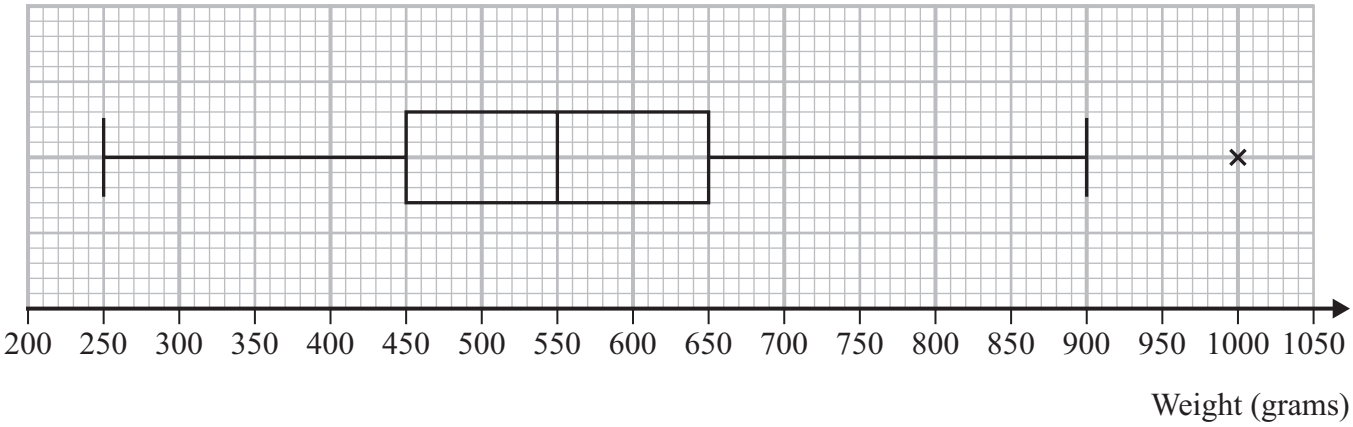
**7.** A farmer supplies cabbages to a local supermarket. The supermarket manager takes a random sample of 200 of these cabbages and the weight of each cabbage is recorded.

The weights of the cabbages in the sample are summarised in the following box plot.




(a) Use linear interpolation to estimate the probability that a randomly chosen cabbage from this sample has a weight of less than 570 grams.

**(2)**

The supermarket manager takes the quartiles from this sample and now decides to classify any cabbage whose weight is at least $Q_3 + 1.5 \times (Q_3 - Q_1)$ as extra-large.

(b) Find the minimum weight of a cabbage that the supermarket manager would classify as extra-large.

**(1)**

The supermarket manager assumes that the weights of cabbages supplied to the supermarket may be modelled by a normal distribution.

(c) Explain whether or not the box plot supports this assumption.

**(1)**

The farmer records the weight of every cabbage harvested from a field and classifies any cabbage whose weight is more than 2 standard deviations above the mean as an outlier.

Assuming that the weights of the cabbages from this field may be modelled by a normal distribution,

(d) find the probability that a randomly selected cabbage harvested from the field would be classified as an outlier using the farmer's method.

**(2)**

The mean weight of the cabbages harvested from the field is 560 grams.

Given that a cabbage with a weight of 1000 grams is classified as an outlier by the farmer,

(e) find the maximum possible value of the standard deviation of the weights of cabbages harvested from the field.

**(2)**

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**Question 7 continued**

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**(Total for Question 7 is 8 marks)**

**TOTAL FOR PAPER IS 75 MARKS**

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