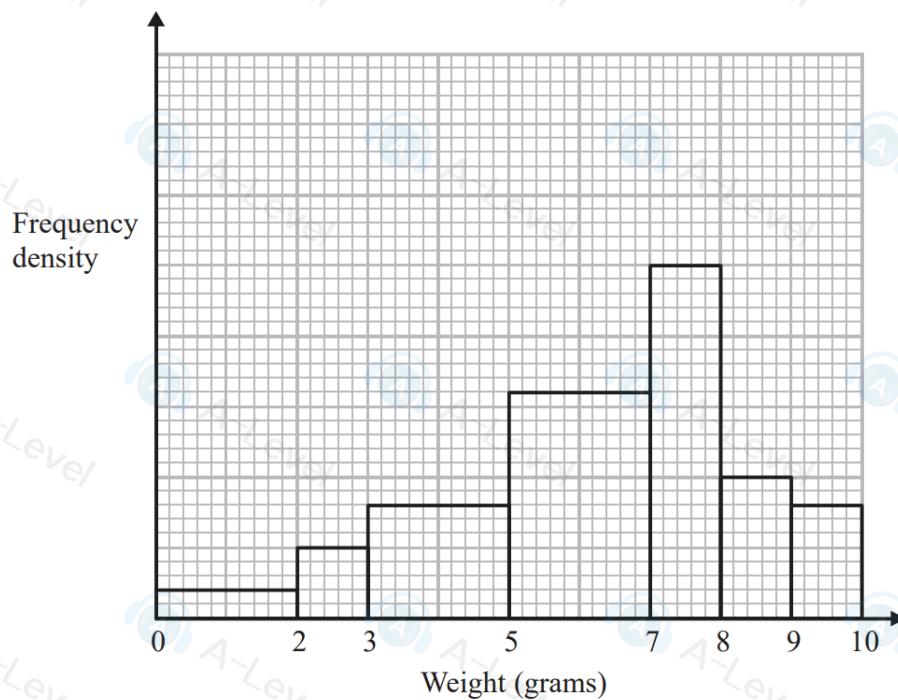


1. Ralph records the weights, in grams, of 100 tomatoes. This information is displayed in the histogram below.



Given that 5 of the tomatoes have a weight between 2 and 3 grams,

- (a) find the number of tomatoes with a weight between 0 and 2 grams. (2)

One of the tomatoes is selected at random.

- (b) Find the probability that it weighs more than 3 grams. (2)

- (c) Estimate the proportion of the tomatoes with a weight greater than 6.25 grams. (2)

- (d) Using your answer to part (c), explain whether or not the median is greater than 6.25 grams. (1)

Given that the mean weight of these tomatoes is 6.25 grams and using your answer to part (d),

- (e) describe the skewness of the distribution of the weights of these tomatoes. Give a reason for your answer. (1)

Two of these 100 tomatoes are selected at random.

- (f) Estimate the probability that both tomatoes weigh within 0.75 grams of the mean. (4)

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1. Two classes of students, class A and class B , sat a test.

Class A has 10 students. Class B has 15 students.

Each student achieved a score, x , on the test and their scores are summarised in the table below.

	n	$\sum x$	$\sum x^2$
Class A	10	770	59610
Class B	15	t	58035

The mean score for Class A is 77 and the mean score for Class B is 61

- (a) Find the value of t (1)

- (b) Calculate the variance of the test scores for each class. (3)

The highest score on the test was 95 and the lowest score was 45

These were each scored by students from the same class.

- (c) State, with a reason, which class you believe they were from. (1)

The two classes are combined into one group of 25 students.

- (d) (i) Find the mean test score for all 25 students.
(ii) Find the variance of the test scores for all 25 students. (4)

The teacher of class A later realises that he added up the test scores for his class incorrectly. Each student's test score in class A should be increased by 3

- (e) Without further calculations, state, with a reason, the effect this will have on
(i) the variance of the test scores for class A
(ii) the mean test score for all 25 students
(iii) the variance of the test scores for all 25 students.

4. Kris works in the mailroom of a large company and is responsible for all the letters sent by the company. The weights of letters sent by the company, W grams, have a normal distribution with mean 165 g and standard deviation 35 g.

(a) Estimate the proportion of letters sent by the company that weigh less than 120 g. (3)

Kris splits the letters to be sent into 3 categories: heavy, medium and light, with $\frac{1}{3}$ of the letters in each category.

(b) Find the weight limits that determine medium letters. (4)

A heavy letter is chosen at random.

(c) Find the probability that this letter weighs less than 200 g. (3)

Kris chooses a random sample of 3 letters from those in the mailroom one day.

(d) Find the probability that there is one letter in each of the 3 categories. (3)

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(5)

5. The distance an athlete can throw a discus is normally distributed with mean 40 m and standard deviation 4 m

(a) Using standardisation, show that the probability that this athlete throws the discus less than 38.8 m is 0.3821 (2)

This athlete enters a discus competition.

To qualify for the final, they have 3 attempts to throw the discus a distance of more than 38.8 m

Once they qualify, they do not use any of their remaining attempts.

Given that they qualified for the final and that throws are independent,

(b) find the probability that this athlete qualified for the final on their second throw with a distance of more than 44 m (5)

(5)