

Central tendency and variation

Question Paper 1

Level	International A Level
Subject	Maths
Exam Board	CIE
Topic	Representation of data
Sub Topic	Central tendency and variation
Booklet	Question Paper 1

Time Allowed: 58 minutes

Score: /48

Percentage: /100

Grade Boundaries:

A*	A	B	C	D	E	U
>85%	'77.5%	70%	62.5%	57.5%	45%	<45%

- 1 Find the mean and variance of the following data. [3]

5 -2 12 7 -3 2 -6 4 0

- 2 A traffic camera measured the speeds, x kilometres per hour, of 8 cars travelling along a certain street, with the following results.

62.7 59.6 64.2 61.5 68.3 66.9 62.0 62.3

(i) Find $\Sigma(x - 62)$. [1]

(ii) Find $\Sigma(x - 62)^2$. [1]

(iii) Find the mean and variance of the speeds of the 8 cars. [3]

- 3 Swati measured the lengths, x cm, of 18 stick insects and found that $\Sigma x^2 = 967$. Given that the mean length is $\frac{58}{9}$ cm, find the values of $\Sigma(x - 5)$ and $\Sigma(x - 5)^2$. [5]

- 4 The amount of fibre in a packet of a certain brand of cereal is normally distributed with mean 160 grams. 19% of packets of cereal contain more than 190 grams of fibre.
- (i) Find the standard deviation of the amount of fibre in a packet. [3]
- (ii) Kate buys 12 packets of cereal. Find the probability that at least 1 of the packets contains more than 190 grams of fibre. [2]
- 5 Barry weighs 20 oranges and 25 lemons. For the oranges, the mean weight is 220 g and the standard deviation is 32 g. For the lemons, the mean weight is 118 g and the standard deviation is 12 g.
- (i) Find the mean weight of the 45 fruits. [2]
- (ii) The individual weights of the oranges in grams are denoted by x_o , and the individual weights of the lemons in grams are denoted by x_l . By first finding $\sum x_o^2$ and $\sum x_l^2$, find the variance of the weights of the 45 fruits. [5]
- 6 The amounts of money, x dollars, that 24 people had in their pockets are summarised by $\sum(x - 36) = -60$ and $\sum(x - 36)^2 = 227.76$. Find $\sum x$ and $\sum x^2$. [5]
- 7 The mean of a certain normally distributed variable is four times the standard deviation. The probability that a randomly chosen value is greater than 5 is 0.15.
- (i) Find the mean and standard deviation. [4]
- (ii) 200 values of the variable are chosen at random. Find the probability that at least 160 of these values are less than 5. [5]

- 8 In a normal distribution with mean 9.3, the probability of a randomly chosen value being greater than 5.6 is 0.85. Find the standard deviation. [3]

- 9 The values, x , in a particular set of data are summarised by

$$\Sigma(x - 25) = 133, \quad \Sigma(x - 25)^2 = 3762.$$

The mean, \bar{x} , is 28.325.

- (i) Find the standard deviation of x . [4]
- (ii) Find Σx^2 . [2]