
- 2

$$n = 60$$

$$\Sigma x = 29\,970$$

$$\Sigma x^2 = 14\,970\,300$$

Test, at the 5% significance level, whether the population mean mass is 500 grams. [8]

[8]

- 5

- (a)

[4]

This image shows a full page of a handwriting practice worksheet. It consists of multiple rows of horizontal dashed lines spaced evenly apart, providing a guide for letter height and placement. The background is plain white, and there are no margins or additional markings.

- (b)**

[1]

.....

.....

Laxmi finds that exactly 2 households in her sample contain more than 4 people.

- (c)

[1]

.....

.....

- 4

- (a)

[6]

[illegible]

- (b)

[1]

Handwriting practice lines (dotted lines on a solid background) for the letter 'a'.

- 6

The weekly profit, in dollars, made by a certain firm has a normal distribution. In the past, the weekly profit had the distribution $N(736, 26^2)$. Following a change in management, the mean weekly profit for 35 randomly chosen weeks is \$725.

(a) Stating a necessary assumption, test at the 2% significance level whether the mean weekly profit has decreased. [6]

[6]

The mean weekly profit for another random sample of 35 weeks is found and a similar test is carried out at the 2% significance level.

- (b)** State the probability of a Type I error. [1]

.....

.....

.....

.....

- (c) Given that the mean weekly profit is now in fact \$718, find the probability of a Type II error. [5]

[illegible]

Additional page

If you use the following page to complete the answer to any question, the question number must be clearly shown.

[illegible]

3 The time, T minutes, for a certain daily bus journey is normally distributed. The bus company claims that the mean of T is 45. A passenger believes that the mean of T is actually greater than 45. She notes the times taken for this journey on a random sample of 60 days. The results are summarised below.

$n = 60$

$\sum t = 2750$

$\sum t^2 = 127\,000$

(a) Calculate unbiased estimates of the population mean and variance.

[3]

(b) Test the passenger’s belief at the 5% significance level.

[5]

- 6

(a)

[1]

.....

.....

.....

.....

.....

- (b)

[3]

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

At Florence's college, in a random sample of 40 students, it was found that 5 own a Pumpkin phone.

- (c) Calculate an approximate 95% confidence interval for the proportion of students at Florence's college who own a Pumpkin phone. [3]

This image shows a full page of a handwriting practice worksheet. It consists of approximately 20 horizontal rows. Each row is defined by two parallel dotted lines, creating a series of uniform gaps for letter height. The entire page is otherwise blank, with no margins, text, or other markings.