

h	1400	1100	260	840	900	550	1230	100	770
t	3	10	20	9	10	13	5	24	16

[You may assume that $\sum h = 7150$, $\sum t = 110$, $\sum h^2 = 7\,171\,500$, $\sum t^2 = 1716$, $\sum th = 64\,980$ and $S_u = 371.56$]

- Calculate S_{th} and S_{hh} . Give your answers to 3 significant figures. (3)
- Calculate the product moment correlation coefficient for this data. (2)
- State whether or not your value supports the use of a regression equation to predict the air temperature at different heights on this mountain. Give a reason for your answer. (1)
- Find the equation of the regression line of t on h giving your answer in the form $t = a + bh$. (4)
- Interpret the value of b . (1)
- Estimate the difference in air temperature between a height of 500 m and a height of 1000 m.

(2)





2. The marks of a group of female students in a statistics test are summarised in Figure 1

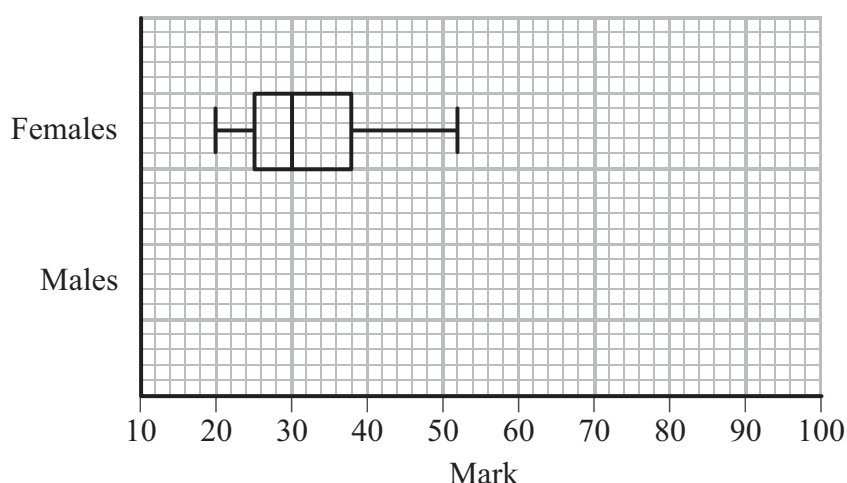


Figure 1

- (a) Write down the mark which is exceeded by 75% of the female students.

(1)

The marks of a group of male students in the same statistics test are summarised by the stem and leaf diagram below.

Mark	(2 6 means 26)	Totals
1	4	(1)
2	6	(1)
3	4 4 7	(3)
4	0 6 6 7 7 8	(6)
5	0 0 1 1 1 3 6 7 7	(9)
6	2 2 3 3 3 8	(6)
7	0 0 8	(3)
8	5	(1)
9	0	(1)

- (b) Find the median and interquartile range of the marks of the male students.

(3)

An outlier is a mark that is

either more than $1.5 \times$ interquartile range above the upper quartile

or more than $1.5 \times$ interquartile range below the lower quartile.



- (5)

- (2)





4. The following table summarises the times, t minutes to the nearest minute, recorded for a group of students to complete an exam.



x	1	2	3	4	5	6
$P(X=x)$	a	a	a	b	b	0.3

- (a) Given that $E(X) = 4.2$ find the value of a and the value of b . (5)
- (b) Show that $E(X^2) = 20.4$ (1)
- (c) Find $\text{Var}(5 - 3X)$ (3)

A biased die with five faces is rolled. The discrete random variable Y represents the score which is uppermost. The cumulative distribution function of Y is shown in the table below.

y	1	2	3	4	5
$F(y)$	$\frac{1}{10}$	$\frac{2}{10}$	$3k$	$4k$	$5k$

- (d) Find the value of k . (1)
- (e) Find the probability distribution of Y . (3)

Each die is rolled once. The scores on the two dice are independent.

- (f) Find the probability that the sum of the two scores equals 2 (2)





(a) the value of μ (3)

(b) the percentage of tins that contain more than 225 g of beans. (3)

(c) Given that 98% of tins contain between 200 g and 210 g find the value of σ . (4)

