Progress Test Revision #3
Statistics : Year 1

Question 1

(i) For a large population give one advantage of Simple Random Sampling in comparison to a Census.

(ii) For a large population give one advantage of a Census in comparison to Simple Random Sampling.

Question 2

The raw mark, x, scored by each candidate in a statistics examination, is coded using

$$y = \frac{x + 26}{1.2}$$

(i) What is the coded mark for a student who had the highest raw mark of 94 ?

(ii) What is the coded mark for a student who had the lowest raw mark of 16 ?

The coded marks have a mean of 74 and standard deviation of 13.

(iii) What is the mean and standard deviation of the raw marks.

Question 3

Four examination scores have a mean of 52.
When one score is removed, the mean of the three remaining scores is 60.
What is the numerical value of the removed score ?

Question 4

Buzz'd Coffee™ is sold in tins.
The quality control department of a large supermarket chain measures the masses of the contents of a random sample of 90 tins of Buzz'd Coffee™ from a large consignment. The results are shown in the table below.

Mass, m, (g)	Midpoint, x, (g)	Frequency, f
$240 \leqslant m < 245$	242.5	8
$245 \leqslant m < 248$	246.5	15
$248 \leqslant m < 252$	250	35
$252 \leqslant m < 255$	253.5	23
$255 \leqslant m < 260$	257.5	9

(You may use $\sum fx^2 = 5\,644\,171.75$)

(i) Estimate the mean and the standard deviation of the mass of the contents of a packet of Buzz'd Coffee™ to two decimal places.

(ii) Use linear interpolation to determine an estimate of the median mass of the contents of a packet of Buzz'd Coffee™ to one decimal place.

(iii) In view of your previous answers state, giving a reason, if the skew of the distribution of the mass of the contents of the packets of Buzz'd Coffee™ is negative, symmetric, or positive.

(iv) A histogram is drawn and the class $245 \leqslant m < 248$ is represented by a rectangle of width 1.2 cm and height 10 cm. What will be the width and height of the rectangle representing the class $248 \leqslant m < 252$?

Question 5

Shrewsbury School has the following make up of students in sixth form

	Year 12	Year 13
Male	136	116
Female	66	58

In order to gauge the general level of satisfaction with their Christmas lunch, it is decided to take a stratified sample of 50 students, who will then be given a questionnaire to complete.

How many students of each gender in each of the two years should be given the questionnaire ?

Question 6

A group of twenty Year 9 pupils have their reaction times measured as part of a Physics experiment. In the group are 12 boys and 8 girls.

The mean reaction time for the boys is 1.80 seconds.

The mean reaction time for the girls is 1.65 seconds.

Calculate the mean reaction time for the whole group.

Question 7

The masses of 31 Jersey cows were recorded to the nearest kilogram and the findings are presented in the table below.

Mass, kg	300 - 349	350 - 399	400 - 449	450 - 499	500 - 549
Frequency	3	6	10	7	5

(i) Find an estimate for the lower quartile mass.

(ii) Find an estimate for the upper quartile mass.

(iii) Interpret the meaning of the value you have found for the upper quartile in part (ii)