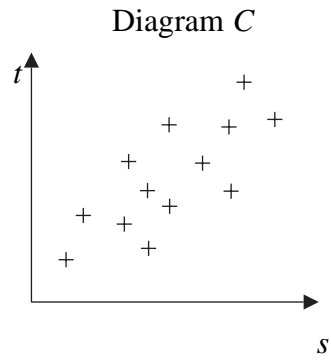
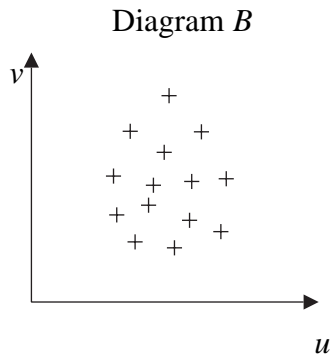
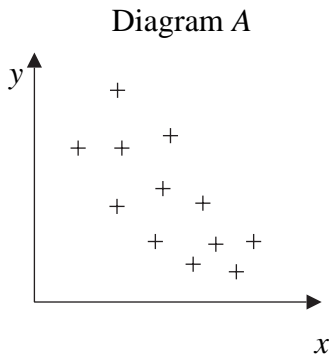


1. The scatter diagrams below were drawn by a student.



The student calculated the value of the product moment correlation coefficient for each of the sets of data.

The values were

0.68 -0.79 0.08

Write down, with a reason, which value corresponds to which scatter diagram.

(6)



2. The following table summarises the distances, to the nearest km, that 134 examiners travelled to attend a meeting in London.

Distance (km)	Number of examiners
41–45	4
46–50	19
51–60	53
61–70	37
71–90	15
91–150	6

- (a) Give a reason to justify the use of a histogram to represent these data. (1)
- (b) Calculate the frequency densities needed to draw a histogram for these data.
(DO NOT DRAW THE HISTOGRAM) (2)
- (c) Use interpolation to estimate the median Q_2 , the lower quartile Q_1 , and the upper quartile Q_3 of these data. (4)

The mid-point of each class is represented by x and the corresponding frequency by f . Calculations then give the following values

$$\Sigma fx = 8379.5 \quad \text{and} \quad \Sigma fx^2 = 557489.75$$

- (d) Calculate an estimate of the mean and an estimate of the standard deviation for these data. (4)

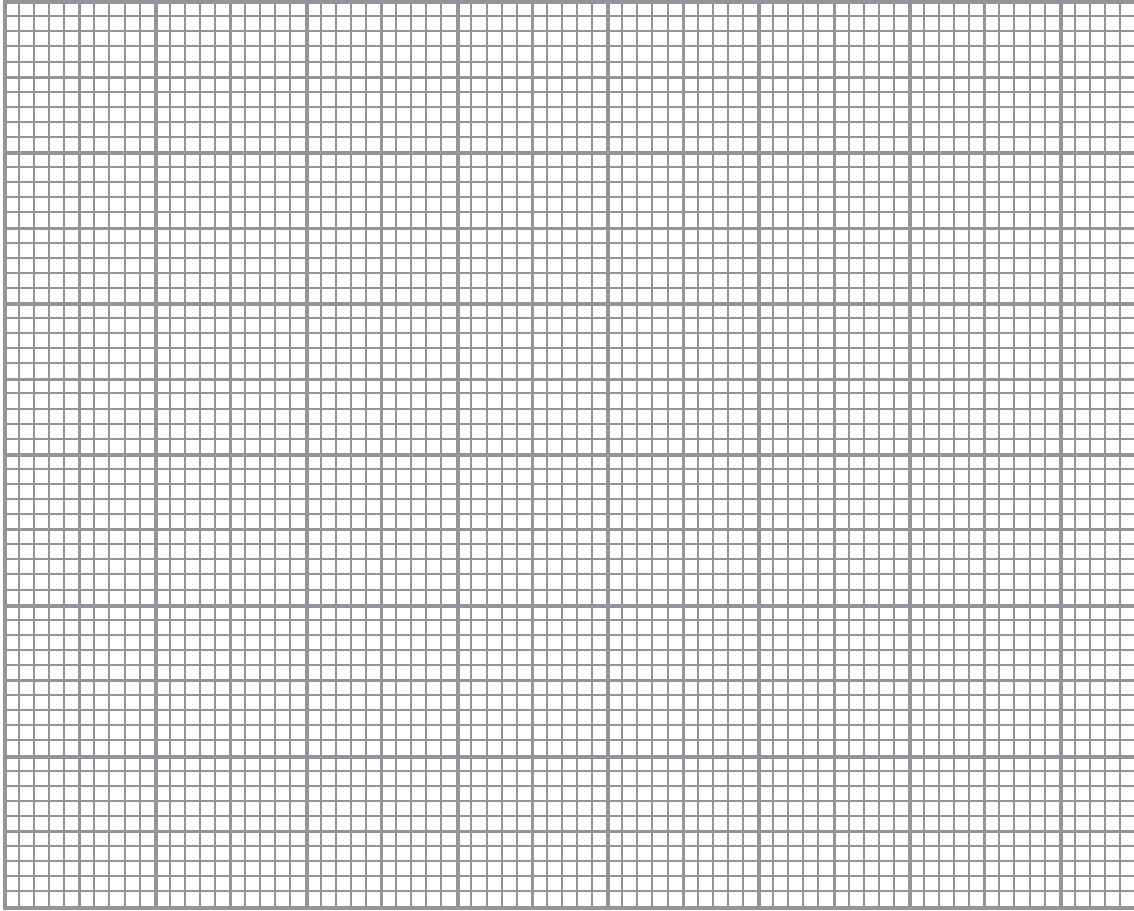
One coefficient of skewness is given by

$$\frac{Q_3 - 2Q_2 + Q_1}{Q_3 - Q_1}$$

- (e) Evaluate this coefficient and comment on the skewness of these data. (4)
- (f) Give another justification of your comment in part (e). (1)



Question 4 continued



Handwriting lines for the answer.

(Total 10 marks)

Q4

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6. A scientist found that the time taken, M minutes, to carry out an experiment can be modelled by a normal random variable with mean 155 minutes and standard deviation 3.5 minutes.

Find

(a) $P(M > 160)$. (3)

(b) $P(150 \leq M \leq 157)$. (4)

(c) the value of m , to 1 decimal place, such that $P(M \leq m) = 0.30$. (4)



7. In a school there are 148 students in Years 12 and 13 studying Science, Humanities or Arts subjects. Of these students, 89 wear glasses and the others do not. There are 30 Science students of whom 18 wear glasses. The corresponding figures for the Humanities students are 68 and 44 respectively.

A student is chosen at random.

Find the probability that this student

(a) is studying Arts subjects, (4)

(b) does not wear glasses, given that the student is studying Arts subjects. (2)

Amongst the Science students, 80% are right-handed. Corresponding percentages for Humanities and Arts students are 75% and 70% respectively.

A student is again chosen at random.

(c) Find the probability that this student is right-handed. (3)

(d) Given that this student is right-handed, find the probability that the student is studying Science subjects. (3)



