

Statistics S1 Advanced Subsidiary

For Edexcel

Paper L

Time: 1 hour 30 minutes

Instructions and Information

Candidates may use any calculator EXCEPT those with the facility for symbolic algebra, differentiation and/or integration.

Full marks may be obtained for answers to ALL questions.

The booklet ‘Mathematical Formulae and Statistical Tables’, available from Edexcel, may be used.

When a calculator is used, the answer should be given to an appropriate degree of accuracy.

Advice to Candidates

You must show sufficient working to make your methods clear to an examiner.

Answers without working may gain no credit.

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1. Give an example of:
- (a) qualitative data, (2)
- (b) quantitative data. (2)
-

2. (a) On graph paper draw a histogram to represent the age of the work force in a small company. (4)

Age last birthday, x	$16 \leq x < 20$	$20 \leq x < 25$	$25 \leq x < 30$	$30 \leq x < 40$	$40 \leq x < 50$	$50 \leq x < 70$
Frequency, f	14	28	36	44	48	30

- (b) Calculate the mean and standard deviation of the ages. (4)
- (c) Approximately how many of the work force were aged between 35 and 55 to the nearest year? (3)
-

3. The following data shows the scores achieved by 12 students in both an IQ test and a mathematics test.

IQ, x	111	105	122	99	133	120	115	108	95	108	134	126
Maths, y	78	70	80	56	88	85	77	82	63	77	90	84

$$\sum x = 1376, \quad \sum y = 930, \quad \sum x^2 = 159530, \quad \sum y^2 = 73196 \text{ and } \sum xy = 107872$$

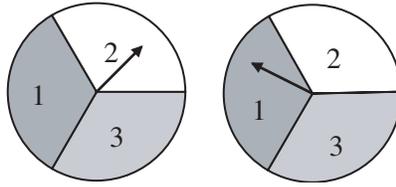
- (a) Calculate the product moment correlation coefficient for this data. (7)
- (b) What does this coefficient measure? (2)
- (c) Calculate the linear regression line in the form $y = a + bx$. (4)
- (d) If a student has an IQ score of 100, what score should he achieve for his mathematics? (2)
-

4. A and B are two events such that $P(A) = \frac{1}{4}$, $P(B) = \frac{1}{2}$ and $P(A|B) = \frac{1}{3}$.
- (a) Find $P(A \cap B)$. (2)
- (b) Draw a Venn diagram to represent this information. (3)
- Find
- (c) $P(A'|B)$ (3)
- (d) $P(A|B')$ (3)
- (e) State, with a reason, if A and B are independent events. (2)
-

5. Sunflowers are found to have heights that are Normally distributed with mean 1.7 metres and standard deviation 30 cm.
- Find
- (a) the probability that a sunflower has a height greater than 1.8 metres, (3)
- (b) the probability that a sunflower has a height less than 1.5 metres, (3)
- (c) the probability that out of three randomly selected sunflowers, 2 have heights greater than 1.8 metres and one a height of less than 1.5 metres. (3)
- (d) the height exceeded by only 5% of the sunflowers. (3)
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6. A company produces Christmas crackers that should each contain a hat, a toy and a joke. Unfortunately the dispensing machine is faulty. The probability that it dispenses a hat is 50%, a toy is 70% and a joke is only 15%.
- Find the probability that a randomly selected cracker contains:
- (a) all three items, (2)
- (b) a hat and a joke but no toy, (2)
- (c) just a toy, (2)
- (d) a hat or a joke but not both. (4)
-

7. Jane spins the two arrows on the discs and multiplies together the two resulting numbers.



Let X be the product of these two numbers.

- (a) Draw up a table to show all the possible scores that could be obtained and their corresponding probabilities. (5)
 - (b) Find $E(X)$ and $Var(X)$ (5)
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