

Statistics S1 Advanced Subsidiary

For Edexcel

Paper H

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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Welwyn Garden City
Herts. AL8 6LP
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1. The trainer at a fitness club takes a record of the total distance, in kilometres, travelled on the treadmills by 80 of its members in the course of a week. The results are summarized as follows

$$\sum x = 1100 \quad \sum x^2 = 17816 \quad (4)$$

Calculate the mean and standard deviation of the distances run.

2. Sean has a mixed bag of tulip bulbs, 16 red, 10 white and 14 pink. He selects two bulbs at random for planting. Find the probability that

(a) both bulbs are white (2)

(b) both bulbs are the same colour (2)

(c) at least one bulb is red. (2)

3. (a) On graph paper draw a histogram for the different lengths of the phone calls, measured to the nearest minute, shown in the table below. (4)

Length of phone call (minutes)	-1	-2	-5	-10	-20	-40
Number of calls	17	28	42	55	20	10

(b) Justify the use of a histogram to display this data. (2)

(c) Find the number of calls that were recorded as lasting between 3 and 12 minutes. (2)

4. A group of young children were asked to draw a line length of 10 cm without the aid of a ruler. The resulting line lengths, X , can be assumed to follow a normal distribution with mean 10 cm and standard deviation 0.8 cm.

(a) Find $P(X > 11)$. (4)

(b) Find $P(|X - 10| < 1)$. (5)

5. The number of correctly answered questions by 30 quiz teams is shown below.

Questions	21	22	23	24	25	26	27	28	29	30
Number of teams	2	3	5	4	3	5	2	3	2	1

- (a) Calculate the range, median and interquartile range of these scores. (5)
- (b) Draw a boxplot for this data. (4)
- (c) Comment on any skewness. (1)
-

6. 150 sports enthusiasts enrolled at a sports centre for one of the following sports as shown:

	Male	Female
Tennis	22	30
Hockey	17	28
Football	48	5

If a person is selected at random find the probability that they are:

- (a) a tennis player (2)
- (b) a female hockey player (2)
- (c) a male who does not play tennis (2)

A female player is selected.

- (d) Find the probability that she plays football. (3)
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7. The probability density function of a discrete random variable Y is shown below:

y	2	3	4	5
$P(Y = y)$	0.2	a	0.35	b

- (a) Given that $E(Y) = 3.75$, find the values of a and b . (4)
- (b) Find $Var(Y)$. (3)
- (c) Find
- (i) $E(8 - 2Y)$
- (ii) $Var(8 - 2Y)$. (4)
-

8. Eight mathematics graduates were asked their current gross weekly wage in £'s, w , and how many years it had been since they graduated, y . The results are shown below.

y	9	4	18	7	10	12	15	20
w	800	540	1220	900	1040	860	1300	1500

(a) Draw a scatter diagram for this information (3)

You may assume

$$\sum y = 95 \quad \sum w = 8160 \quad \sum y^2 = 1339 \quad \sum w^2 = 8991200 \quad \sum yw = 107840$$

(b) Find the product moment correlation coefficient. (7)

(c) Calculate the linear regression line for w on y in the form $w = a + by$. (4)

(d) Give an interpretation for the values of a and b . (2)

(e) Would you use this model to predict for a graduate 40 years after graduating? (2)

Explain your answer.
