Please check the examination details below before entering your candidate information

Candidate surname	Other names

Centre Number | Candidate Number

Pearson Edexcel International Advanced Level

Tuesday 19 May 2026

Morning (Time: 1 hour 30 minutes)

Paper reference **WST01/01**

Mathematics

International Advanced Subsidiary/Advanced Level
Statistics S1

You must have:
Mathematical Formulae and Statistical Tables (Yellow), calculator

Total Marks

Candidates may use any calculator permitted by Pearson regulations. Calculators must not have the facility for symbolic algebra manipulation, differentiation and integration, or have retrievable mathematical formulae stored in them.

Instructions

- Use **black** ink or ball-point pen.
- If pencil is used for diagrams/sketches/graphs it must be dark (HB or B).
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions and ensure that your answers to parts of questions are clearly labelled.
- Answer the questions in the spaces provided – *there may be more space than you need.*
- You should show sufficient working to make your methods clear. Answers without working may not gain full credit.
- Values from the statistical tables should be quoted in full. If a calculator is used instead of the tables, the value should be given to an equivalent degree of accuracy.
- Inexact answers should be given to three significant figures unless otherwise stated.

Information

- A booklet 'Mathematical Formulae and Statistical Tables' is provided.
- There are 8 questions in this question paper. The total mark for this paper is 75.
- The marks for **each** question are shown in brackets – *use this as a guide as to how much time to spend on each question.*

Advice

- Read each question carefully before you start to answer it.
- Try to answer every question.
- Check your answers if you have time at the end.
- If you change your mind about an answer, cross it out and put your new answer and any working underneath.

Turn over ▶

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1. The probability distribution of a discrete random variable X is given by

$$P(X = x) = \begin{cases} \frac{1}{5} & x = 1,2,3,4,5 \\ 0 & \text{otherwise} \end{cases}$$

(a) Write down the value of $E(X)$

(1)

(b) Find the value of $E(X^2)$

(2)

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Question 1 continued

(Total for Question 1 is 3 marks)

2. Brett plays a game with only two outcomes, win and lose.

The game has 3 levels of difficulty, easy, medium and hard.

Brett plays the game exactly 3 times each day, always starting with an easy level game.

- the probability that Brett wins an easy level game is 0.9
- the probability that Brett wins a medium level game is 0.6
- the probability that Brett wins a hard level game is 0.3
- if a game is lost, then the next game that day is at the same level of difficulty
- if a game is won, then the next game that day is at the next level of difficulty

(a) Complete the tree diagram on the opposite page to illustrate this information.
You should

- add the remaining branches
- include all the remaining probabilities

(3)

(b) Find the probability that Brett wins all 3 games on a given day.

(2)

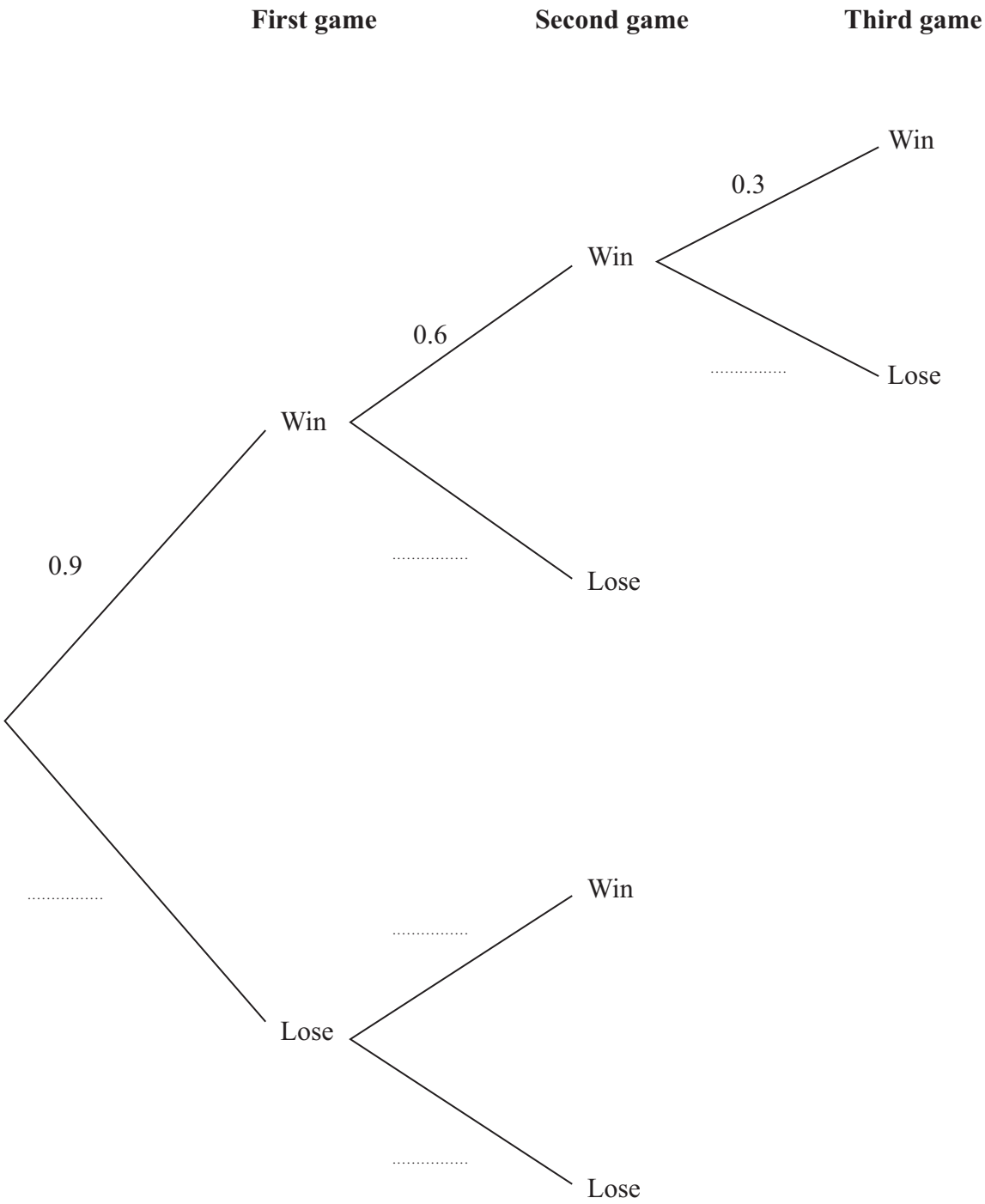
(c) Find the probability that Brett wins exactly 2 games on a given day.

(3)

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Question 2 continued



Question 2 continued

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Question 2 continued

(Total for Question 2 is 8 marks)

3. The table below shows the number of hours worked in a given week, to the nearest hour, by a group of 64 freelance photographers.

Hours (h)	Frequency (f)	Hours midpoints (x)
0 – 10	5	5.25
11 – 20	16	15.5
21 – 25	14	23
26 – 30	17	28
31 – 40	10	35.5
41 – 49	2	45

[You may use $\sum fx = 1517.25$ and $\sum fx^2 = 41\,368.3125$]

A histogram (not shown) has been drawn to represent these data.

The bar representing the class 11 – 20 hours has width 3.2 cm and height 7.5 cm.

(a) Calculate the width and the height of the bar representing the class 21 – 25 hours.

(3)

(b) Use linear interpolation to estimate the median number of hours worked.

(2)

(c) (i) Show that an estimate of the mean number of hours worked is 23.71 correct to 2 decimal places.

(ii) Estimate the standard deviation of the number of hours worked.

(3)

(d) Explain why the answers to part (c) are estimates.

(1)

(e) Describe, giving a reason, the skewness of these data.

(1)

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Question 3 continued

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Question 3 continued

(Total for Question 3 is 10 marks)

4. The discrete random variable X has the following probability distribution

x	1	2	3	4	5
$P(X = x)$	a	a^2	0.26	0.34	0.16

where a is a constant.

(a) Use algebra to show that $a = 0.2$

(3)

(b) Find $E(2X + 4)$
You must show your working.

(3)

(c) Find $\text{Var}(2X + 4)$
You must show your working.

(4)

(d) Hence, write down the value of $\text{Var}(4 - 2X)$

(1)

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Question 4 continued

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Question 4 continued

(Total for Question 4 is 11 marks)

5. The table below shows some summary statistics for 10 pairs of bivariate observations, based on 2 variables x and y

	Mean	**Variance**
x	163.5	148.05
y	61.5	205.25

(a) (i) Show that $\sum x^2 = 268\,803$

(ii) Find the value of $\sum y^2$

(3)

Given that $\sum xy = 102\,230$

(b) (i) show that $S_{yy} = 2052.5$

(ii) find the value of S_{xy}

(3)

Given also that $S_{xx} = 1480.5$

(c) calculate the value of the product moment correlation coefficient for these data.

(2)

(d) Describe what your answer to part (c) suggests about the relationship between x and y

(1)

Another piece of data, $x = 163.5$ and $y = 61.5$, is now included with the other 10 bivariate observations.
The product moment correlation coefficient for these 11 bivariate observations, T, is calculated.

(e) **Without further calculation**, state how the value of T will compare with the answer to part (c).
Give a reason for your answer.

(2)

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Question 5 continued

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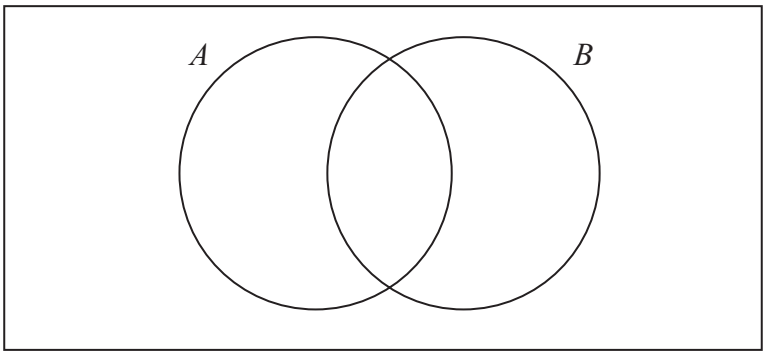
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Question 5 continued

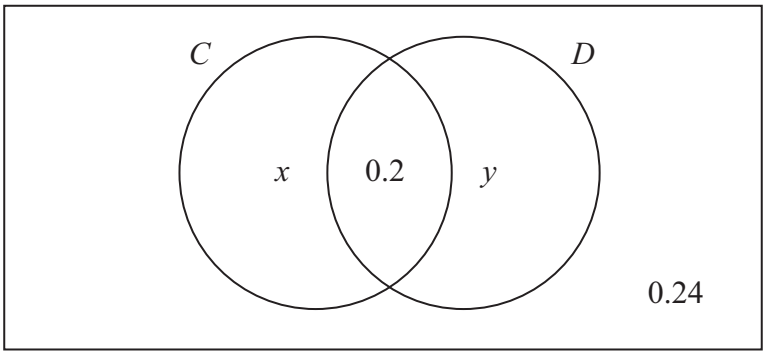
(Total for Question 5 is 11 marks)

6. (a) Shade the region representing $A' \cap B'$ on the Venn diagram below.

(1)



Events C and D are shown in the Venn diagram below, where x, y, 0.2 and 0.24 are probabilities.



(b) Find an expression in terms of x for

(i) $\mathrm{P}(C)$

(ii) $\mathrm{P}(D \mid C)$

(2)

(c) Find an expression in terms of x and y for $\mathrm{P}(C \cup D)$

(1)

Given that $\mathrm{P}(C) = 3\mathrm{P}(D)$

(d) find the value of x and the value of y

(4)

(e) State, giving a reason, whether or not the events C and D are statistically independent.

(2)

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Question 6 continued

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Question 6 continued

(Total for Question 6 is 10 marks)

7. A chemistry teacher recorded the mark in a theory test, t, and the mark in a practical test, p, for 12 students.

Here are the paired results for these two tests.

t	23	46	35	58	97	21	29	83	60	53	75	80
p	33	42	47	68	95	42	45	81	74	40	85	92

The teacher knows that 2 other students missed the practical test but sat the theory test. To predict practical test marks for these students, she decides to calculate the least squares regression line of p on t

The teacher calculated the following summary statistics

$$\bar{t} = 55 \qquad \bar{p} = 62 \qquad S_{tp} = 5780 \qquad S_{tt} = 6948$$

(a) Use these summary statistics to find the equation of the least squares regression line of p on t, giving your answer in the form $p = a + bt$
You must show your working clearly.

(4)

(b) Give an interpretation of the gradient of your regression line.

(1)

The theory test marks for the two students who missed the practical test were

Student	Mark in the theory test
A	62
B	20

(c) Using your answer to part (a) estimate

(i) the practical test mark for student A

(ii) the practical test mark for student B

(3)

(d) State, giving a reason, which of the two estimates found in part (c) would give the more reliable estimate.

(2)

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Question 7 continued

Question 7 continued

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Question 7 continued

(Total for Question 7 is 10 marks)

8. The weights, X grams, of tins of coconut milk are normally distributed with

$$X \sim \mathrm{N}(443, 9)$$

A tin is selected at random.

(a) Find, using standardisation, the probability that the weight of this tin is

(i) less than 440 grams,

(ii) between 441.5 grams and 447.5 grams.

(4)

(b) Find the value of k such that $\mathrm{P}(443 - k < X < 443 + k) = 0.98$

(3)

The weights, Y grams, of tins of carrots are normally distributed with

$$\mathrm{Y} \sim \mathrm{N}(\mu, \sigma^2)$$

Given that 2.5% of these tins weigh less than 338.1 grams and 30% weigh more than 344 grams,

(c) calculate the mean and standard deviation of their weights.

(5)

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Question 8 continued

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Question 8 continued

Question 8 continued

(Total for Question 8 is 12 marks)

TOTAL FOR PAPER IS 75 MARKS

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