



H10-30min Spreadsheets and ICT (Higher): 30-minute Pack

EDEXCEL 1ST0 · Calculator allowed · about 30 minutes

Total Marks

Name: _____ Date: ____ / ____ / ____

Answer ALL questions. Show all your working.

- 1** A cinema keeps a record, in a spreadsheet, of the ticket price and the number of tickets sold for 3 films. Column D is used to calculate the total revenue for each film.

	A	B	C	D
1	Film	Ticket price (£)	Tickets sold	Total revenue (£)
2	Action Movie	8.50	120	
3	Comedy Show	7.00	95	
4	Animated Film	6.50	150	

- (a) Write down the formula that should be typed into cell D2 to calculate the total revenue for Action Movie. (1)
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- (b) Work out the value that would appear in cell D2. (2)
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- (c) The manager notices that the ticket price for Action Movie was entered incorrectly, and corrects cell B2 from 8.50 to 9.00. State what happens to the value shown in cell D2 as a result, and explain why this happens without the manager needing to retype the formula in D2. (2)

(Total for Question 1 is 5 marks)

- 2 A coach records the category and race time, in seconds, of 8 athletes in a spreadsheet, as shown below.

	A	B	C
1	Name	Category	Time (s)
2	Ali	U15	13.8
3	Bea	U17	13.5
4	Cai	U17	14.2
5	Dee	U15	12.9
6	Emi	U17	13.9
7	Fay	U15	14.5
8	Gus	U17	13.2
9	Hana	U15	13.6

- (a) The data is sorted first by Category (A to Z), and then, within each category, by Time (smallest to largest). Write down the name that would appear in row 2 after this two-level sort. (1)

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- (b) Write down the name that would appear in row 6 after this two-level sort. (1)

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- (c) A filter is then applied to the original (unsorted) data, so that only athletes in category U17 with a time under 13.8 seconds remain visible. Write down the names that would remain visible. (2)

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(Total for Question 2 is 4 marks)

- 3** A quality-control inspector weighs 6 packets from a production line and enters the weights, in grams, into a spreadsheet, as shown below. Cell B8 contains the formula =AVERAGE(B2:B7).

	A	B	C
1	Packet	Weight (g)	Squared deviation
2	Packet 1	198	
3	Packet 2	202	
4	Packet 3	196	
5	Packet 4	204	
6	Packet 5	200	
7	Packet 6	200	
8	Mean		
9	Standard deviation		

- (a) The formula $= (B2 - \$B\$8)^2$ is typed into cell C2, and copied down to cells C3 to C7. Explain why the reference to cell B8 must be an absolute reference (\$B\$8), rather than a relative reference (B8), for this formula to work correctly when it is copied down. (2)
- (b) Work out the value that would appear in cell B8. (2)
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- (c) Work out the value that would appear in cell C4. (2)
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- (d) A further cell contains the formula =SQRT(AVERAGE(C2:C7)). State what statistical measure this formula calculates for the six packet weights. (1)

(Total for Question 3 is 7 marks)

4 A spreadsheet's chart tool is used to plot a scatter graph of hours of revision (x) against test score out of 100 (y) for 12 students, and to add a trendline automatically.

- (a) State the type of correlation you would expect between hours of revision and test score. (1)
- (b) Give one advantage of using the spreadsheet's chart tool to add a trendline automatically, rather than drawing a line of best fit by eye. (1)
- (c) The trendline has equation $y = 4.5x + 32$, where x is hours of revision and y is predicted test score. Use this equation to predict the test score for a student who revises for 6 hours. (1)
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- (d) The same equation is used to predict the score for a student who plans to revise for 20 hours. Work out this prediction, and comment on whether it is reliable. (2)

(Total for Question 4 is 5 marks)

- 5** A national weather agency processes the daily rainfall total recorded at each of 3000 weather stations, using spreadsheet software rather than manual calculation.
- (a) Give one advantage of using spreadsheet software, rather than manual calculation, to find the mean daily rainfall across all 3000 weather stations. (1)
- (b) Give one disadvantage or risk of relying entirely on spreadsheet software when processing data on this scale. (1)
- (c) "For very large data sets, using ICT is always better than manual calculation." (3)
Discuss this statement, giving a reason for the statement and a reason against it, and give a justified overall conclusion.

(Total for Question 5 is 5 marks)

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- 6** A shop assistant's spreadsheet is meant to calculate the mean weekly footfall (number of customers) from 9 weeks of data stored in cells B2 to B10. The formula used is =SUM(B2:B9)/8.
- (a) Identify the error in this formula. (1)
- (b) Write a corrected formula, using a named function, that would correctly calculate the mean footfall for all 9 weeks in B2 to B10. (2)
- (c) The original (incorrect) formula, =SUM(B2:B9)/8, returns a value of 46.75. Use this to work out the sum of the footfall values in cells B2 to B9, and explain whether it is possible to determine the correct mean of all 9 weeks (B2 to B10) using only this information. (2)

(Total for Question 6 is 5 marks)

Mark scheme • H10-30min Spreadsheets and ICT (Higher): 30-minute Pack

Question 1

- (a) **B1** =B2*C2 oe (accept =C2*B2)
- (a) **Answer: =B2*C2**
- (b) **M1** 8.50 x 120, oe
- (b) **A1** 1020 or 1020.00 cao
- (b) **Answer: 1020.00**
- (c) **B1** the value in D2 updates/recalculates automatically (to 1080)
- (c) **B1** because the formula in D2 references cell B2, and a spreadsheet automatically recalculates any formula whenever a value it depends on changes
- (c) **Answer: It updates automatically to 1080, because the formula in D2 refers to cell B2, and a spreadsheet recalculates a formula automatically whenever a value it references changes.**

Question 2

- (a) **B1** Dee cao
- (a) **Answer: Dee**
- (b) **B1** Gus cao
- (b) **Answer: Gus**
- (c) **B1** Bea and Gus identified (13.5 and 13.2, both category U17 and under 13.8 seconds)
- (c) **B1** Cai and Emi correctly excluded (14.2 and 13.9 are not under 13.8 seconds), with all category U15 athletes also excluded
- (c) **Answer: Bea, Gus**

Question 3

- (a) **B1** without the \$ signs, the reference to B8 would shift down by one row for each row copied (e.g. to B9, then B10, and so on)
- (a) **B1** the mean is only stored once, in cell B8, so every copy of the formula must refer back to that same fixed cell to calculate each deviation correctly
- (a) **Answer: Without the dollar signs, the reference would shift down a row each time the formula is copied (to B9, then B10, and so on), but the mean is only stored in cell B8, so every copy must refer back to that one fixed cell for the calculation to work.**
- (b) **M1** (198+202+196+204+200+200) / 6, oe
- (b) **A1** 200 cao
- (b) **Answer: 200**
- (c) **M1** (196-200)², oe (using the value 196 from B4 and the mean 200 from B8)
- (c) **A1** 16 cao
- (c) **Answer: 16**
- (d) **B1** the standard deviation cao
- (d) **Answer: The standard deviation**

Question 4

- (a) **B1** positive (correlation) cao
- **(a) Answer: Positive correlation**
- (b) **B1** any valid advantage, e.g. it is calculated by a fixed, consistent method, so it does not vary between people or between attempts, unlike a line drawn by eye
- **(b) Answer: It is calculated by a fixed method, so it gives the same precise line every time, unlike a line of best fit drawn by eye, which can vary from person to person.**
- (c) **B1** 59 cao
- **(c) Answer: 59**
- (d) **M1** $4.5 \times 20 + 32$, oe (= 122)
- (d) **B1** not reliable, e.g. 20 hours is far beyond the range of the original data (extrapolation), and 122 is not even a possible test score out of 100
- **(d) Answer: 122; this is not reliable, since 20 hours is far beyond the range of the original data (extrapolation), and a score of 122 is not even possible out of 100.**

Question 5

- (a) **B1** any valid advantage, e.g. it can process a very large amount of data almost instantly, which would take a very long time by hand and would be far more likely to contain an arithmetic error
- **(a) Answer: It processes all 3000 values almost instantly, which would take a very long time by hand and would be far more likely to contain an arithmetic error.**
- (b) **B1** any valid disadvantage, e.g. a single error in the data or in a formula could go unnoticed and affect every calculated result, or specialist software/training may be needed
- **(b) Answer: If the data or a formula contains even one error, it could affect every result calculated from it, and this might not be noticed among so many values.**
- (c) **B1** a reason supporting the statement, e.g. ICT can handle far more data, far more quickly and consistently, than a person calculating by hand
- (c) **B1** a reason against the statement, e.g. ICT still depends on the data and formulas being correct in the first place, and specialist software or training is not always available
- (c) **B1** a clear, justified conclusion, e.g. ICT is usually better for very large data sets, but is not automatically 'always' better, since the result is still only as good as the data and formulas used
- **(c) Answer: ICT lets huge amounts of data be processed quickly and consistently, which manual calculation cannot match, but it is only as good as the data and formulas entered, so it is not automatically better in every case. Overall, ICT is usually the better choice for very large data sets, provided the data and formulas are checked.**

Question 6

- (a) **B1** the range only covers B2:B9 (8 cells), missing B10, and the formula divides by 8, when it should divide by 9 (for 9 values)
- **(a) Answer: The range should be B2:B10, to include all 9 weeks, and the formula should divide by 9, not 8.**
- (b) **B1** AVERAGE used as a named function, e.g. =AVERAGE(...)
- (b) **B1** correct range B2:B10
- **(b) Answer: =AVERAGE(B2:B10)**
- (c) **B1** $46.75 \times 8 = 374$, so the sum of the values in B2:B9 is 374
- (c) **B1** no, it is not possible, since the value in B10 (the 9th week) is not known, so the total for all 9 weeks cannot be found from this information alone
- **(c) Answer: The sum of B2:B9 is 374 (46.75×8), but the value in B10 is still unknown, so the correct mean of all 9 weeks cannot be determined from this information alone.**