Spreadsheets – 2021/20 IGCSE 0417

1. Nov/2021/Paper_11/No.10

(a) Explain the differences between a VLOOKUP function and a LOOKUP function.

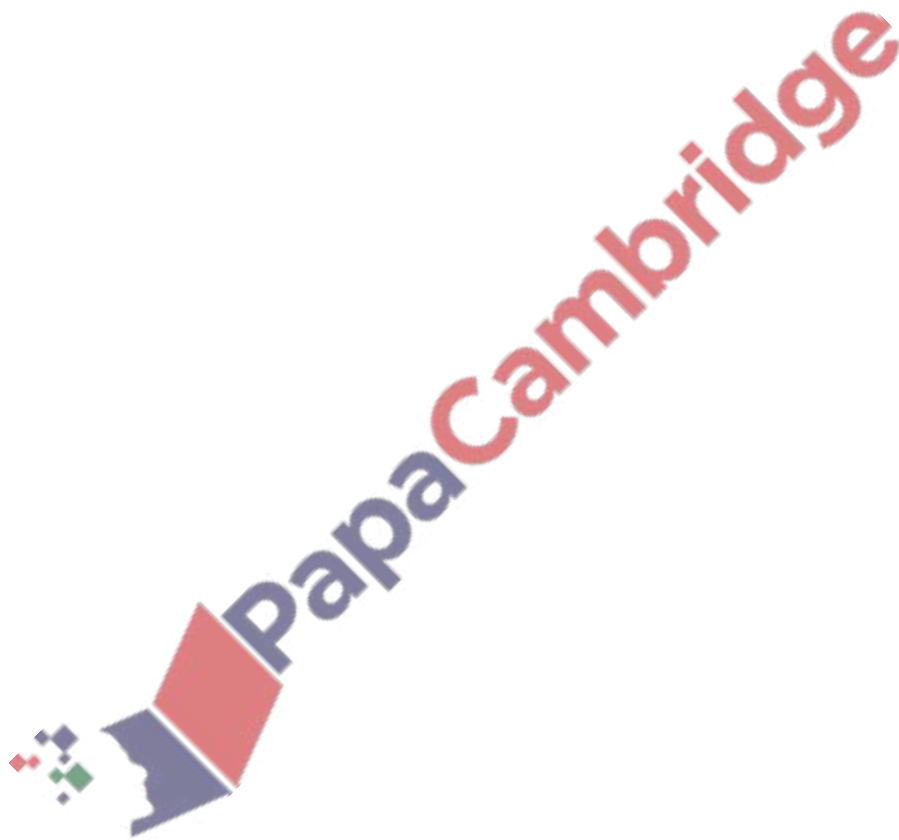..

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(b) A spreadsheet contains a list of staff and the rooms they work in at a school.

	A	B	C	D	E
1	Room	Department	Name		
2	29	Languages	Aaron Garcia	31	=VLOOKUP(D2,A2:C7,3)
3	30	History	Julieta Diaz		
4	28	Chemistry	Ernesto Fernandez		
5	26	Biology	Salvador Calbo		
6	31	ICT	David James		
7	49	Mathematics	Adriene Martinez		

(i) Explain, in detail, what the formula in cell E2 does.

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(ii) When certain room numbers are typed into cell D2 unexpected results appear in cell E2.

Suggest improvements that could be made to ensure the correct result is displayed.

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A teacher in the school has created a spreadsheet to display whether a student has good timekeeping when arriving at lessons. He has produced a formula but thinks it could be improved. The formula is:

=IF(B4>=A$18,B$18,IF(B4>=A$17,B$17,IF(B4>=A$16,B$16,IF(B4>=A$15,B$15,IF(B4>=A$14,B$14,"")))))

	A	B	C
1			
2	Name of Student		
3	Half term	Lates	
4	1	17	=IF(B4>=A$18,B$18,IF(B4>=A$17,B$17,IF(B4>=A$16,B$16,IF(B4>=A$15,B$15,IF(B4>=A$14,B$14,"")))))
5	2	20	
6	3	1	
7	4	12	
8	5	18	
9	6	0	
10			
11			
12			
13			
14	0	Excellent	
15	1	Very Good	
16	5	Good	
17	15	Poor	
18	25	Very Poor	

(c) Write down the value that should appear in cell C4.

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(d) The teacher has improved the formula and has typed in =VLOOKUP(B4,A$14:B$18,2)

Explain the advantages of using this formula compared to the original one.

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2.

A school is planning to change the way it reports back to parents about their child's academic progress. They plan to produce a mail merged document and then email this to parents.

They have created a spreadsheet which shows the pupil's name, target, attainment and effort levels for Maths and the Science subjects.

Part of the spreadsheet is shown.
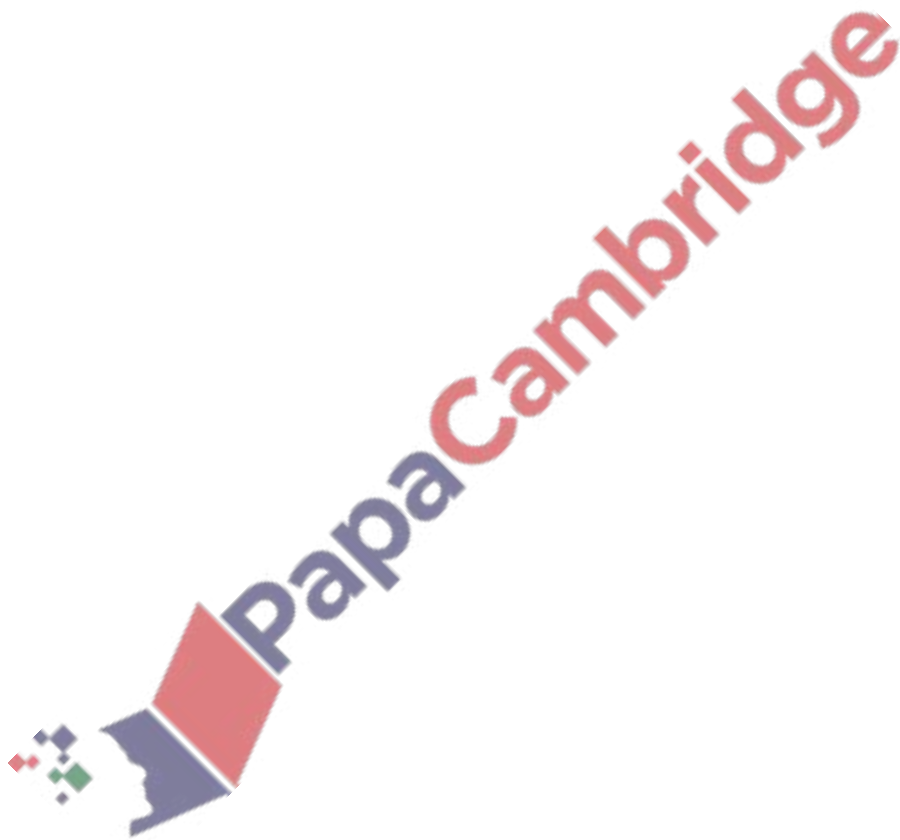
	A	B	C	D	E	F	G	H	I	J	K
1	Name		Target level	Maths		Biology		Chemistry		Physics	
2				Attainment	Effort	Attainment	Effort	Attainment	Effort	Attainment	Effort
3	Ahmal	Wulandan	6	7	2	6	2	8	1	7	2
4	Nurul	Prakoso	8	7	3	7	3	9	1	7	2

(a) Design a suitable document layout to display the information of one pupil. The name of the pupil must be clearly shown separated from the rest of the data. It must have appropriate spacing. Do **not** include the pupil's data.

[6]

(b) The attainment levels range from 1 to 9 and the effort levels range from 1 to 3. Before teachers are allowed to enter data, the spreadsheet needs to be tested.

Write down **one** example of extreme data to test the attainment field and **one** example of abnormal data to test the effort field.

Attainment – extreme data ....

Effort – abnormal data ....

[2]

(c) Describe **four** advantages of using a mail merge for this document.

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(d) When the mail merge is created, a special field containing the date needs to be added. This date will change automatically each time the merged document is sent or printed.

Explain how the date field can be added.

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.... [3]

A doctor measures the blood pressure of some of his patients regularly. The patients take home a blood pressure machine and record their results on a spreadsheet which the doctor has created. Part of the spreadsheet is shown.

	A	B	C	D	E	F	G	H	I
1	**Blood pressure readings**					**Blood pressure warnings**			
2	**Date**	**Sys**	**Dia**	**Warning**		**Sys**	**Dia**	**Warning**	
3	10-Feb	134	74	Normal		60	40	Low	
4	11-Feb	137	67	Normal		120	80	Normal	
5	12-Feb	145	81	Mild		140	90	Mild	
6	13-Feb	150	86	Mild		160	100	Moderate	
7	14-Feb	180	74	Severe		180	110	Severe	
8	15-Feb	134	75	Normal					
9	16-Feb	130	57	Normal					

(a) When a reading produces a Severe or Low warning then the text automatically changes to a red font on a light red background.

Explain how the doctor could set up automatic colour change for these warnings on the spreadsheet.

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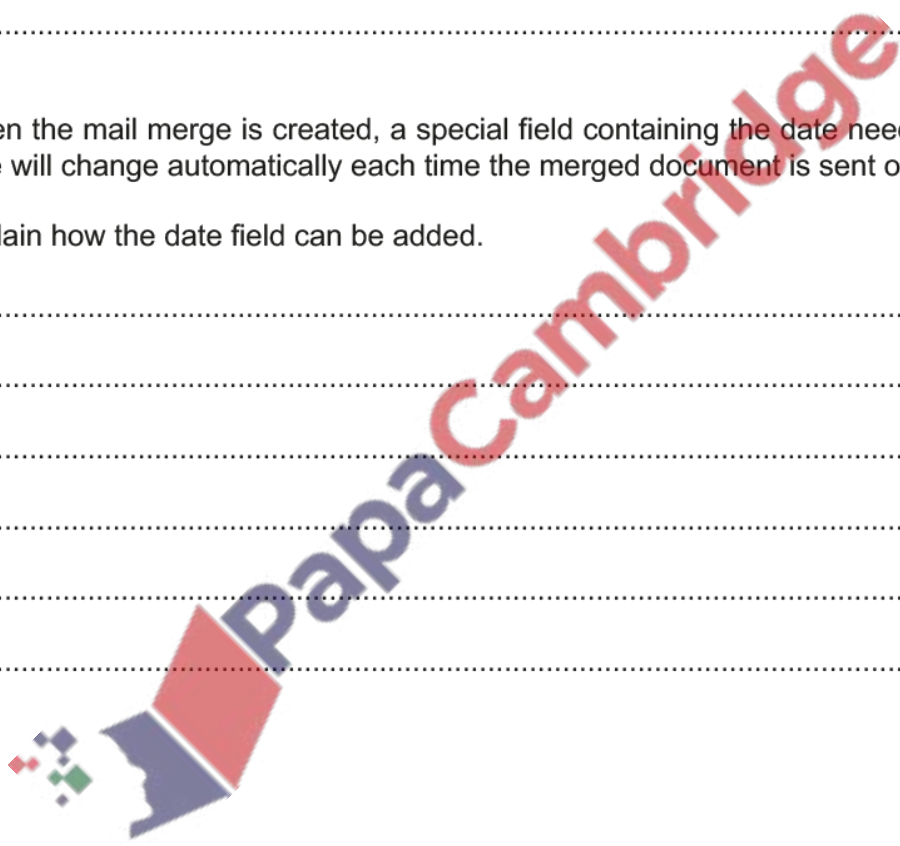... [5]

The doctor has set up a named range called Bloodpressure for the cells F3 to H7.

(b) Explain why the doctor has used a named range.

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The formula =VLOOKUP(B3,Bloodpressure,3) has been entered into cell D3.

(c) Explain what the formula does.

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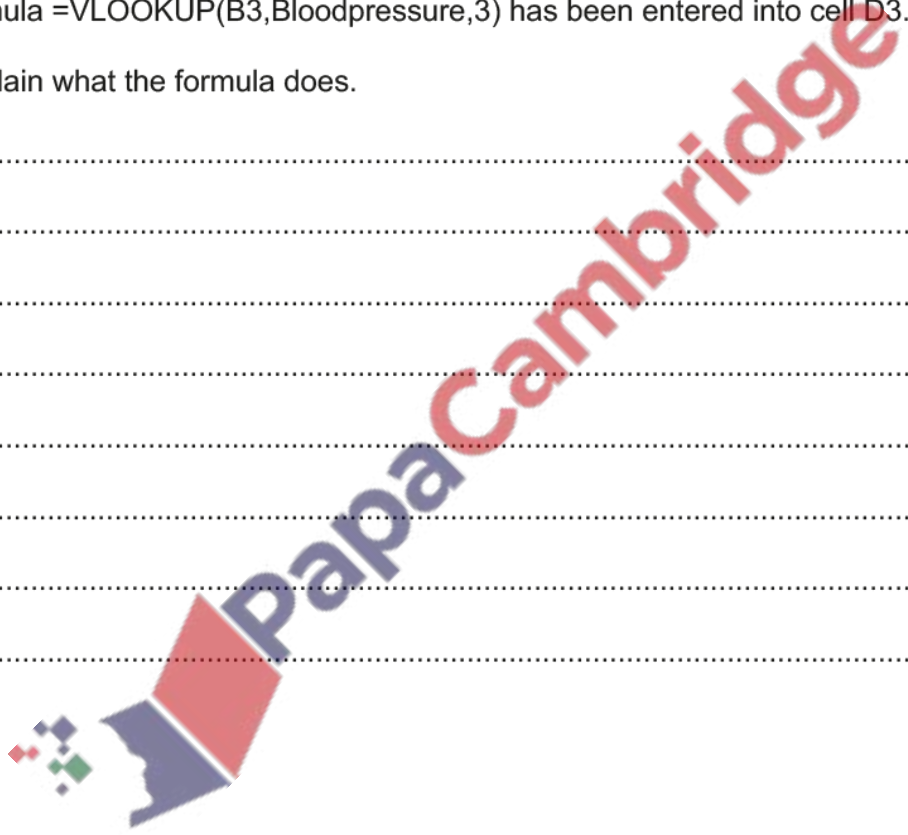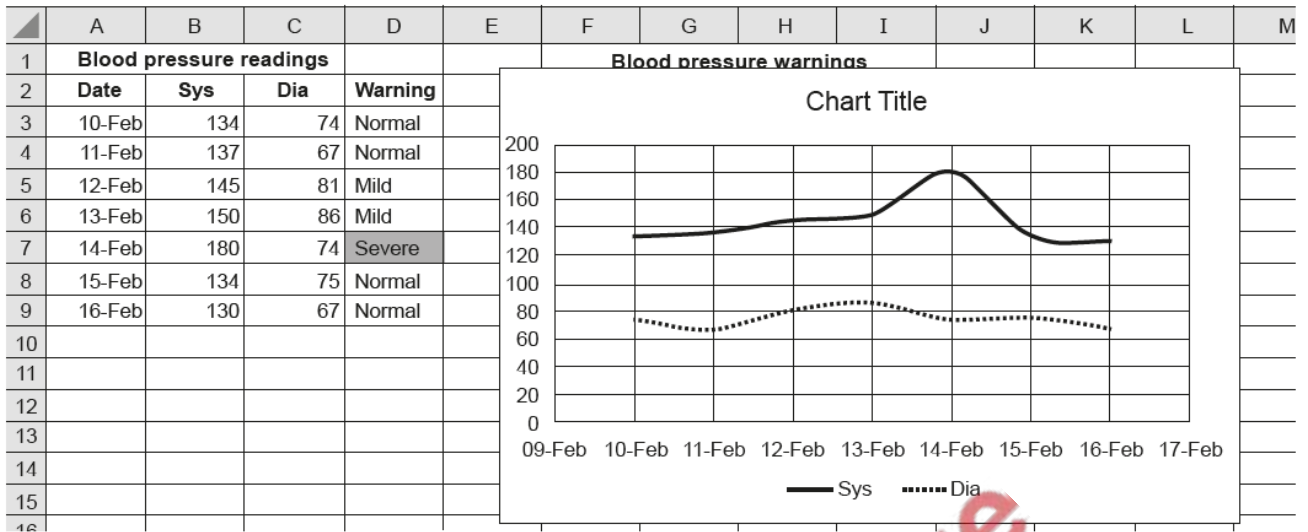.. [4]

The doctor has created a graph of the readings for one patient and has displayed it on the spreadsheet. However, there are elements missing.

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	**Blood pressure readings**					**Blood pressure warnings**							
2	Date	Sys	Dia	Warning									
3	10-Feb	134	74	Normal									
4	11-Feb	137	67	Normal									
5	12-Feb	145	81	Mild									
6	13-Feb	150	86	Mild									
7	14-Feb	180	74	Severe									
8	15-Feb	134	75	Normal									
9	16-Feb	130	67	Normal									
10													
11													
12													
13													
14													
15													
16													

Chart area: Chart Title — y-axis 0 to 200, x-axis 09-Feb to 17-Feb. Legend: Sys, Dia.

(d) Explain how the doctor created the graph. Write in your answer **one** improvement that could be made to the graph.
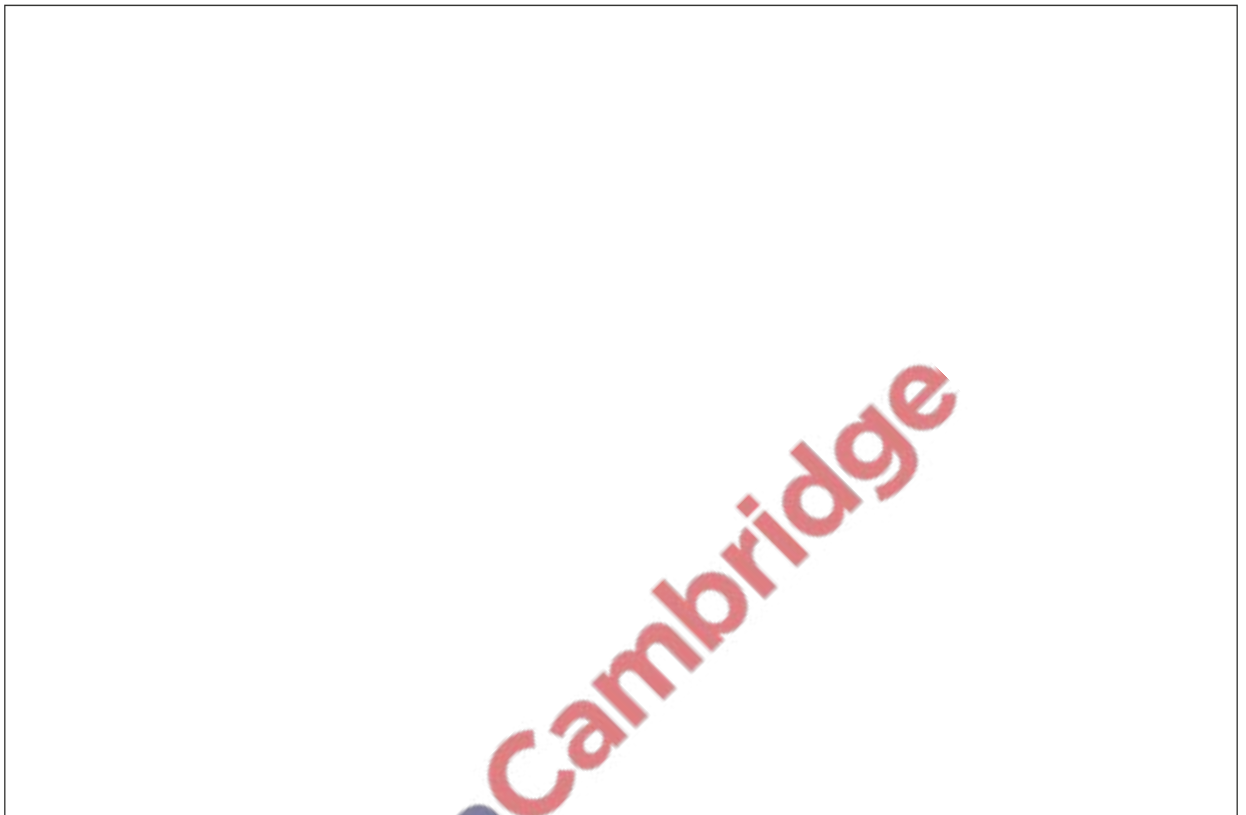
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(e) At the end of the month the doctor needs to produce a hard copy document showing information about a patient: their name, date of birth and patient number, as well as data and the graph from the spreadsheet.

Design a suitable document layout. The document must have appropriate spacing.

[5]

4.

A computer system is being created to calculate the scores in a diving competition. Every dive by an athlete is awarded a score out of 10 by each judge.

The system is being tested using live data. An athlete completes his dive with a difficulty of 3.4 and achieves the following scores, which are displayed in a spreadsheet.

	A	B	C	D	E
1	Athlete:	Shivani Nehwal	Difficulty:	3.4	
2					
3		Score			
4	Judge 1	4.1			
5	Judge 2	6.3			
6	Judge 3	6.2			
7	Judge 4	5.3			
8	Judge 5	7.3			
9	Judge 6	6.1			
10	Judge 7	7.0			
11					
12	Overall Score				

(a) Before the overall score is calculated the judges' scores need to be sorted into ascending order.

Describe the steps that would be carried out to sort the data into ascending order.

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(b) Cell B12 contains the formula, ROUND((SUM(B5:B9)*D1),1).

Explain what the formula in cell B12 does.

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(c) The judges' score column will be tested using normal, abnormal and extreme data.

Explain, giving examples of test data which would be used, what is meant by:
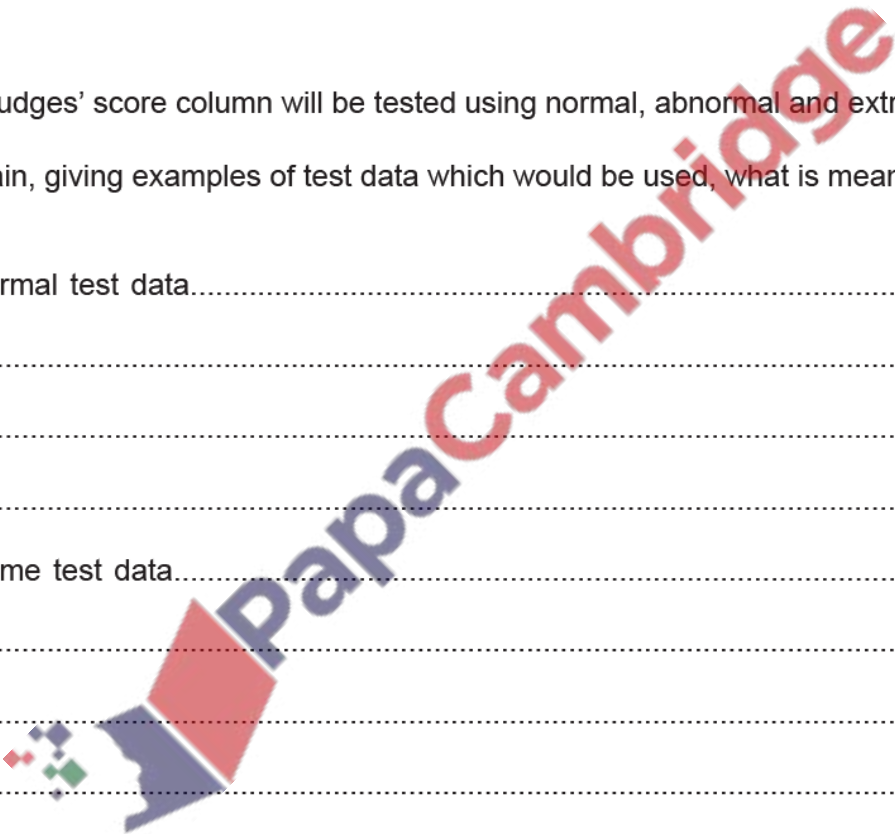
Abnormal test data...

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Extreme test data..

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5.

Tawara school has a shop that sells items needed by pupils in school. Part of a spreadsheet with details of the items is shown.

	A	B	C	D	E	F	G	H	I
1			Tawara School Shop					Tax rate	20%
2	Item		Cost Price	Selling Price	Profit	Tax	Amount sold	Total profit per item	Total tax per item
3									
4	School tie		$7.00	$9.99	$2.99	Y	139	£415.61	$277.72
5	School scarf		$10.00	$15.00	$5.00	Y	50	$250.00	$150.00
6	School blazer		$20.00	$25.00	$5.00	Y	180	$900.00	$900.00
7	Pen set		$10.00	$12.50	$2.50	N	100	$250.00	

(a) Write down the number of rows that are shown in the spreadsheet that contain text.

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(b) Write down the number of columns that are shown in the spreadsheet that contain text.

.... [1]

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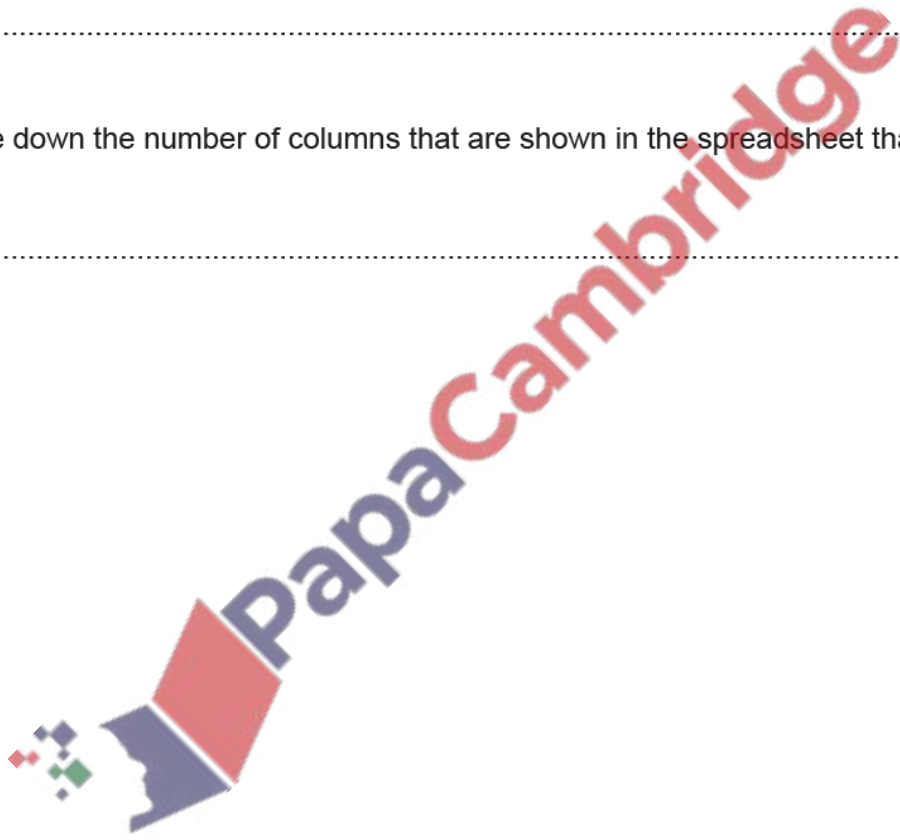
(c) Tax is paid on certain items sold in the shop. The tax rate that has to be paid is 20% of the selling price. If tax is to be paid on an item, then 'Y' is placed underneath the Tax heading.

The formula in I4 is: IF(F4="Y",(I1*D4*G4),"")

Explain, in detail, what the formula does.

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(d) Explain the steps that need to be taken to display cell H4 as US dollars.

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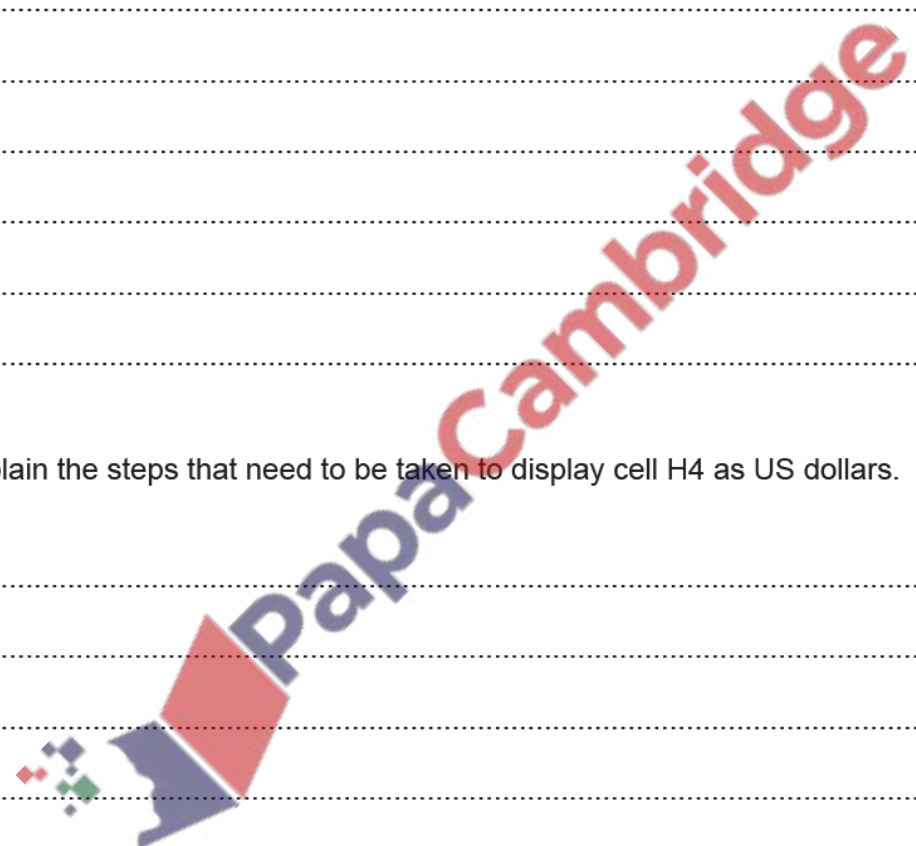... [2]

6.

Many teachers feel that monitoring student progress is an important part of the teaching and learning process.

Describe how the features of a spreadsheet can be used by a teacher to help monitor student progress.

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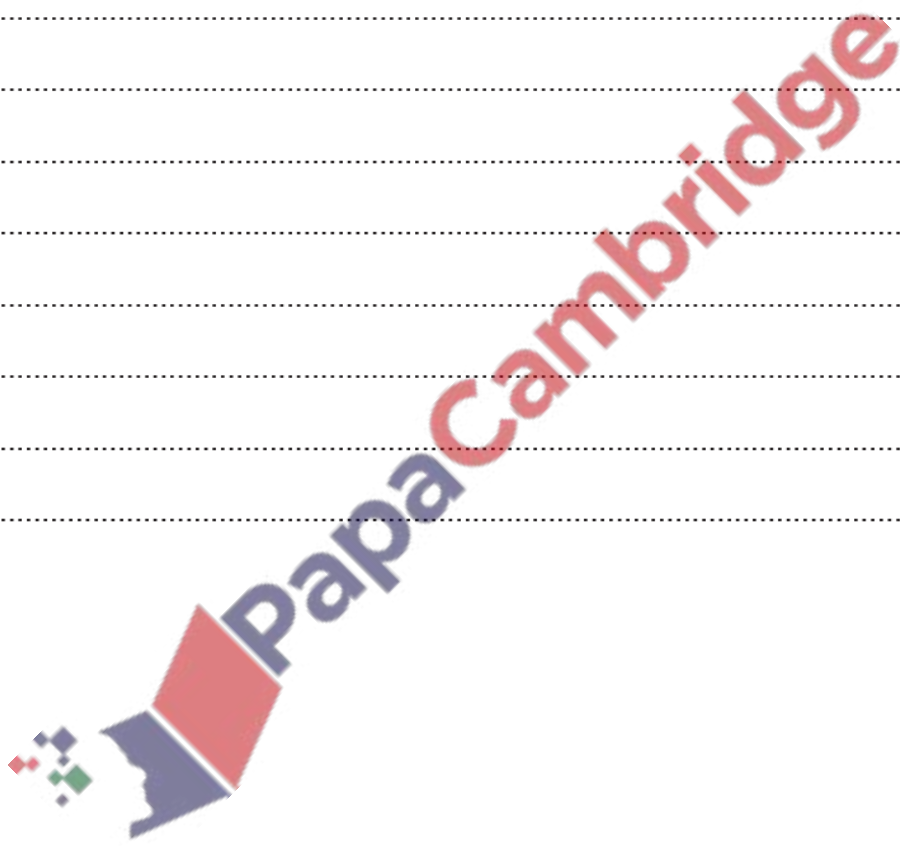... [6]

The student has transferred the data into a spreadsheet in order to create a graph.

	A	B	C	D	E	F	G
1	**World Earthquakes - 2019**						
2	**Country**	**Magnitude**	**Depth(km)**				
3	Vanuatu	6.9	26			Vanuatu	5
4	Vanuatu	6.7	24			Indonesia	1
5	Indonesia	6.1	29			Nepal	1
6	Vanuatu	6.7	27.6			Myanmar	1
7	Nepal	4.1	10.2			Japan	3
8	Myanmar	6.9	136			Ecuador	3
9	Japan	6.2	9			South Georgia	1
10	Japan	6	8			Mexico	2
11	Vanuatu	6.4	16				
12	Japan	7	10				
13	Ecuador	7.8	20.6				
14	South Georgia	6.2	14				
15	Ecuador	6.2	14				
16	Ecuador	6	10				
17	Mexico	6	16				
18	Mexico	6	10				
19	Vanuatu	7	24				

(c) (i) She has entered a formula in cell G3. The formula is

COUNTIF(A$3:A$19,F3)

Explain in detail what the formula in G3 does. Include in your answer an explanation of the use of the $ sign.

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(ii) The student is creating an appropriate chart/graph of the data in cells F3 to G10.

Write down the steps she needs to take to produce a chart/graph of the data on the same sheet. Your answer must include examples of an appropriate title and labels.

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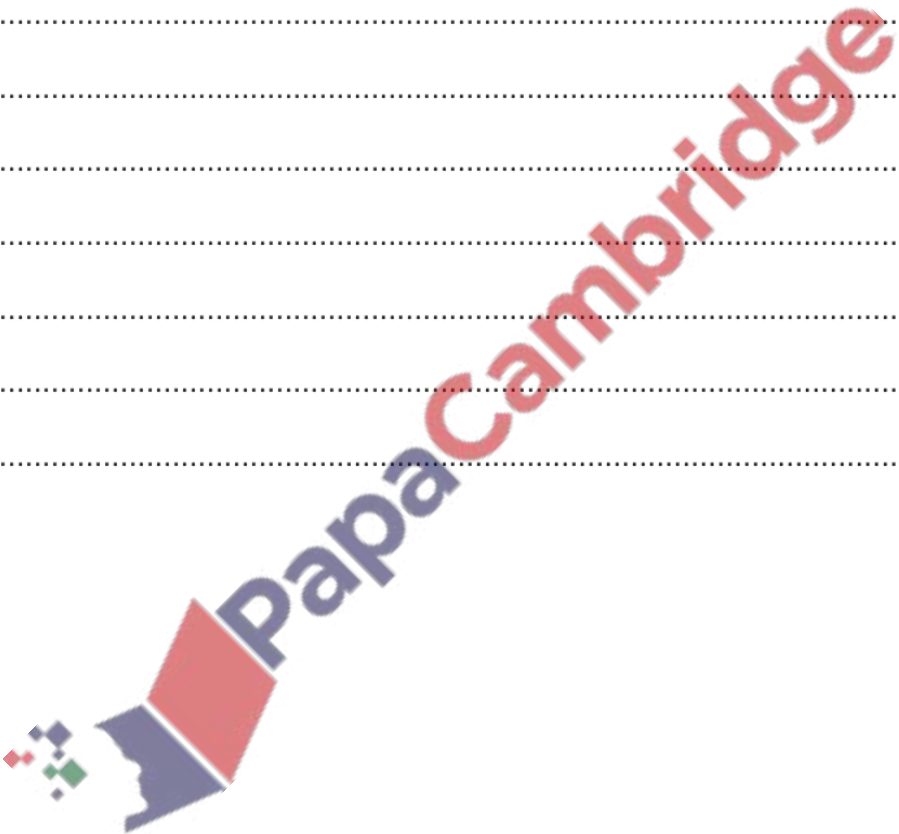
Khalid keeps a spreadsheet to record his expenses and to plan for future spending. This spreadsheet is split into two separate sheets, which he has named Plan and Model.

Plan contains details of his future spending.
Model contains a model of his income and expenses.

Plan

	A	B	C	D	
1	*Income Statement*		% of spending	% of income	
2	Income	63,784			
3					
4	Expenditure items				
5	Taxes	12,757	22.22%	20%	
6	Housing	19,135	33.33%	30%	
7	Food	6,378	11.11%	10%	
8	Transportation	9,568	16.67%	15%	
9	Entertainment/Other	6,378	11.11%	10%	
10	Healthcare	3,189	5.56%	5%	
11					
12	Investment return	4%			
13	Income Growth	2.5%			
14	Expense Ratio %	90%			
15					

Model

	A	B	C	D	E	F	G
1	**Model**						
2		2020	2021	2022	2023	2024	2025
3							
4	Income	63,784	65,379	67,013	68,688	70,406	72,166
5	Investment Income		255	527	816	1,123	1,450
6	Total Income	63,784	65,634	67,540	69,504	71,529	73,616
7							
8	Taxes	12,757	13,076	13,403	13,738	14,081	14,433
9	Housing	19,135	19,614	20,104	20,607	21,122	21,650
10	Food	6,378	6,538	6,701	6,869	7,041	7,217
11	Transportation	9,568	9,807	10,052	10,303	10,561	10,825
12	Entertainment/Other	6,378	6,538	6,701	6,869	7,041	7,217
13	Healthcare	3,189	3,269	3,351	3,434	3,520	3,608
14	Total Expenses	57,405	58,842	60,312	61,820	63,366	64,950
15							
16	Net Income (Savings)	6,379	6,792	7,228	7,684	8,163	8,666
17							
18							
19	Balance Sheet						
20	Savings	6,379	13,171	20,399	28,083	36,246	44,912
21	Can I afford a car?	N	N	N	N	Y	Y
22							

(a) Khalid has entered a formula in cell C4 of the Model sheet. The formula is B4+(B4*Plan!$B13)

Explain, in detail, what the formula does. Include in your answer an explanation of why the $ and the ! are used in the formula.

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(b) He is saving up to buy a new car; this will cost at least $35,000.

Khalid has entered a formula in cell B21 of the Model sheet. The formula is IF(B20>35000,"Y","N")

Explain, in detail, what the formula does.

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Plan

	A	B	C	D
			% of spending	% of income
1	*Income Statement*			
2	Income	63,784		
3				
4	Expenditure items			
5	Taxes	12,757	22.22%	20%
6	Housing	19,135	33.33%	30%
7	Food	6,378	11.11%	10%
8	Transportation	9,568	16.67%	15%
9	Entertainment / Other	6,378	11.11%	10%
10	Healthcare	3,189	5.56%	5%
11				
12	Investment return	4%		
13	Income Growth	2.5%		
14	Expense Ratio %	90%		
15				

(c) Khalid is planning to create an appropriate graph/chart to be placed in a new sheet. The graph/chart will display the % of income and the names of the expenditure items from the Plan sheet.

Identify the most appropriate graph/chart he could use and describe the steps he needs to take to produce this graph/chart in a new sheet.

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A spreadsheet has been produced showing the final places in one of the events in the 2018 Winter Olympic Games.

	A	B	C	D	E	F	G	H	I	J
1										
2	Country	Name	Heat1	Heat2	Heat3	Heat4	Total Time	Min	Seconds	
3	KOR	Yun Sungbin	50.28	50.07	50.18	50.02	200.6	3	20.55	20.6
4	LAT	Martins Dukurs	50.85	50.38	50.32	50.76	202.3	3	22.31	22.3
5	GBR	Dom Parsons	50.85	51.41	49.33	50.62	202.2	3	22.21	22.2
6	OAR	Nikita Tregubov	50.59	50.50	50.50	50.59	202.2	3	22.18	22.2
7	LAT	Tomass Dukurs	50.88	50.58	50.65	50.63	202.7	3	22.74	22.7
8	KOR	Kim Jisoo	50.80	50.86	50.51	50.81	203.0	3	22.98	23.0
9	GER	Axel Jungk	50.77	51.01	50.83	50.99	203.6	3	23.60	23.6
10										

The event consists of four heats. The times taken to complete each heat are added together to give the Total Time, in seconds. This is then displayed as minutes and seconds.

Two formulae form this calculation; they are stored in column H and column J.

The formula in cell H3 is: =INT(G3/60)

(a) Explain what the formula in cell H3 does.

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The formula in cell J3 is: =ROUND(I3,1)

(b) Explain what the formula in cell J3 does.

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At the end of the competition, the table must be sorted into ascending order of Total Time. The top athlete would be in the gold medal position, the second in silver medal position and the third in bronze medal position. The Medal and Rank columns must be added.

This display should look like this:

	A	B	C	D	E	F	G	H	I
1									
2	**Medal**	**Rank**	**Country**	**Name**	**Heat1**	**Heat2**	**Heat3**	**Heat4**	**Total Time**
3	Gold	1	KOR	Yun Sungbin	50.28	50.07	50.18	50.02	200.55
4	Silver	2	OAR	Nikita Tregubov	50.59	50.50	50.50	50.59	202.18
5	Bronze	3	GBR	Dom Parsons	50.85	51.41	49.33	50.62	202.21
6		4	LAT	Martins Dukurs	50.85	50.38	50.32	50.76	202.31
7		5	LAT	Tomass Dukurs	50.88	50.58	50.65	50.63	202.74
8		6	KOR	Kim Jisoo	50.80	50.86	50.51	50.81	202.98
9		7	GER	Axel Jungk	50.77	51.01	50.83	50.99	203.60
10									

(c) Explain the steps that must be taken to amend the spreadsheet and to display the data in this way.

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The heat times are measured by a computer system, but could be measured by officials with stopwatches.

(d) Discuss the advantages and disadvantages of using computers in measurement rather than humans.

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10.

A school examinations officer has set up a spreadsheet of candidates for the IGCSE examinations.

Part of the spreadsheet is shown:

	A	B	C	D	E	F
1	**Subject examination entries**					
2	0417	0486	0500	0580	**Subject code**	**Subject name**
3	ICT	English Lit	English	Mathematics	0417	ICT
4	E	E	E	E	0486	English Lit
5		E		E	0500	English
6		E		E	0580	Mathematics
7	E	E		E		
8	E	E	E	E	**Number of candidates**	
9		E		E	0417	8
10	E	E		E	0486	12
11	E	E		E	0500	5
12	E	E	E	E	0580	12
13		E		E		
14	E	E	E	E		
15	E	E	E	E		

The formula in cell A3 is IF(A2<>"",VLOOKUP(A2,E3:F6,2),"")

(a) Explain what the formula in cell A3 does.

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(b) The examinations officer is planning to change the range E3 to F6 in the formula to a named range.

(i) Explain why he should do this rather than using the cell references.

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(ii) Give an example of an appropriate name he should give the range.

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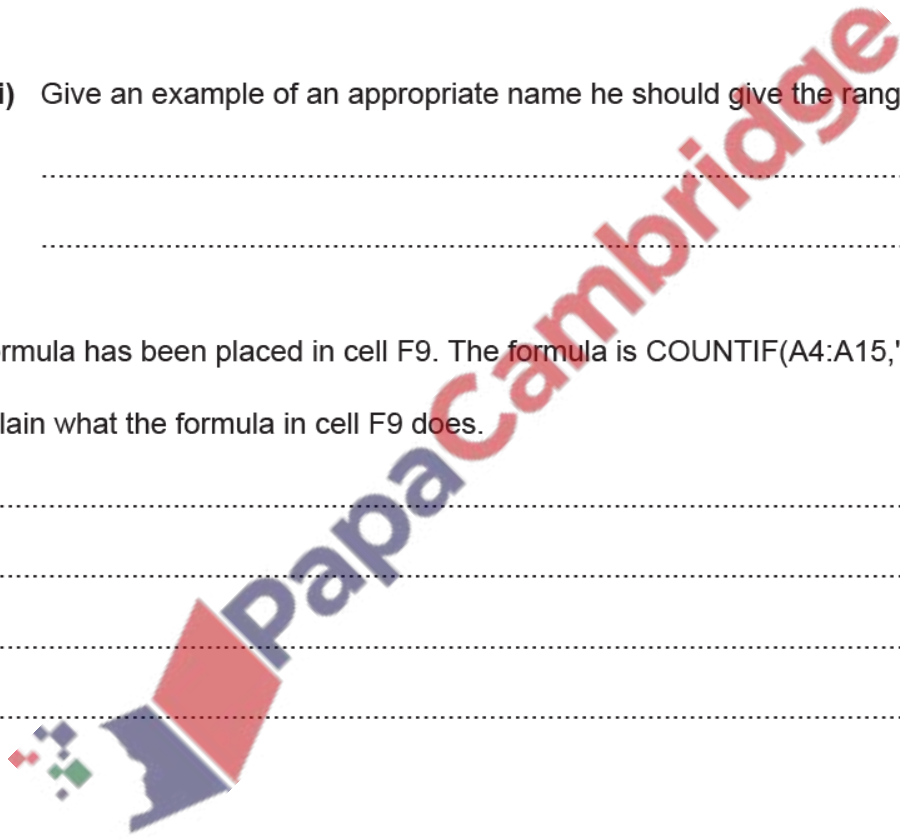
(c) A formula has been placed in cell F9. The formula is COUNTIF(A4:A15,"E")

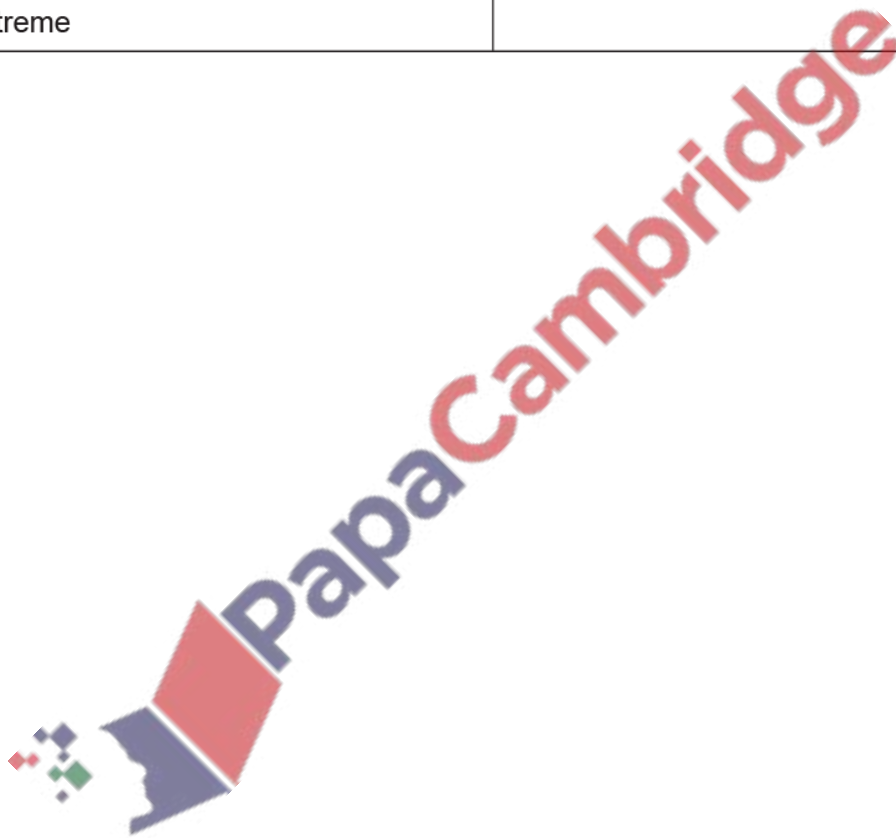Explain what the formula in cell F9 does.

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11.

A teacher is creating a spreadsheet that will record the grades students achieved in recent tests and compare the average grades of these tests with the students' forecast grades. The grading the teacher is using awards 1 for the highest grade down to 10 for the lowest. The teacher has created a validation rule on the grade entered.

(a) Give examples of data used to test the validation rule. Your answers for abnormal test data must be for a different reason in each case.

Type of test data	Example of test data
Normal	
Abnormal	
Abnormal	
Extreme	

[4]

(b) Part of the spreadsheet is shown, column G subtracts the Forecast grade from the Average grade.

	A	B	C	D	E	F	G
1		Grades obtained in:					
2	Student name	Exam 1	Exam 2	Exam 3	Average grade	Forecast grade	Difference
3	Velia Grimaldi	5	7	8	7	6	1
4	Giuseppe Campo	4	5	3	4	4	0
5	Nicola Donati	2	3	3	3	3	0
6	Giovanni Agnelli	1	3	2	2	5	-3

(i) Describe the steps the teacher can take to edit the spreadsheet to prevent new data being typed into the Forecast grade column.

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(ii) The teacher has typed a formula in cell E3. The formula is ROUNDUP(AVERAGE(B3:D3),0)

Explain, in detail, what the formula does.

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(c) The teacher has produced a graph showing the differences between the forecast grade and the average grade for each student. The graph looks like this.
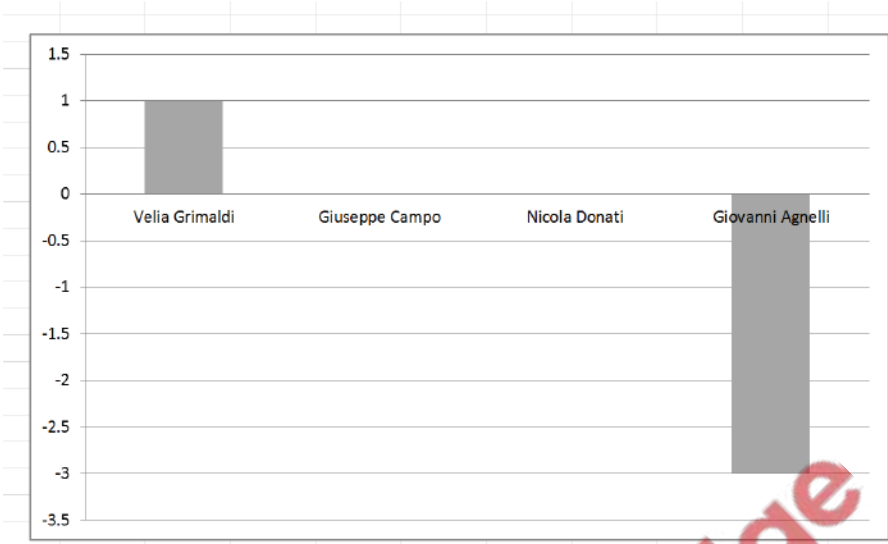
Describe the steps taken to create the graph. Include in your answer **three** improvements that could be made to the graph.

Method..

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Improvement 1..

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Improvement 2..

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Improvement 3..

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[6]

12. June/2020/Paper_13/No.6c,d,e

The secretary of the Tawara Rowing Club is organising a presentation evening for its members. A systems analyst is creating a database for the club to store the details of the members. She is also creating a spreadsheet to show who is attending the presentation evening.

The systems analyst has set up the following fields for the database.

Name_of_person	Date_of_birth	Membership _type	Contact_email	Contact_phone_no	Year _joined	Gender
Nor Kwa	2/4/2005	Social	n.kwa@rockict.com	03 2453 5673	2018	F
Adam Mazian	23/5/2003	Social	AdamM@abc.co.my	082 25 4689	2016	M
Ahmed Othman	12/03/2006	Junior	AOthman@cie.org	01223 432678	2018	M
Zara Png	1/12/1997	Senior	Zara@cbc.cn	123 3267 9999	2010	F

(a) For the following fields write down the most appropriate data type. Each data type must be different. For any numeric field, specify the type of number.

Gender...

Membership_type...

Year_joined..

[3]

29

(b) Design an online data entry form which could be used to enter the details of one member, using all the fields shown in the table.

In your design include appropriate spacing for each field and navigational aids. Do **not** include data in the form.

[8]

(c) A spreadsheet has been created to show which members are attending the presentation evening and who has paid.

Part of the spreadsheet is shown.

	A	B	C	D	E	F	G	H	I	J	K
1	Tawara Rowing Club										
2	Name	Family name	Full name	Type of member	Attending	Number attending	Total owed	Paid		Cost	$
3	Nor	Kwa	Nor Kwa	**Social**	Y	2	50	Y		Junior	10
4	Ahmed	Othman	Ahmed Othman	**Junior**	Y	3	30	Y		Senior	20
5	Zara	Png	Zara Png	**Senior**	Y	1	20	N		Social	25
6	Adam	Mazian	Adam Mazian	**Social**	N	0	0	N			

Write down **three** of the formatting features that have been used in the part of the spreadsheet shown.

1..

....

2..

....

3..

....
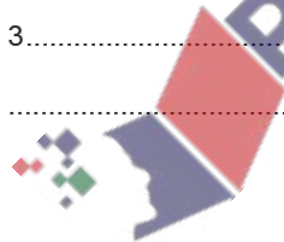
[3]

(d) A formula has been created and placed in cell G3. The formula is:

IF(E3="Y",VLOOKUP(D3,J$3:K$5,2)*F3,0)

Explain what the formula does.

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.... [6]

(e) The secretary needs to identify different types of members in the club.

Describe the steps he would take to sort the data by type of member so that Junior members are at the top of the list.

....

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....

....

.... [3]