

Working it out – Working with formulae

Introduction

The structure of each question paper may vary, but these examples are typical of the activities that learners are expected to complete.

The examples of learner work are based on one of NCFE's retired papers. Additional notes are included to give guidance when working with other assessment papers as tasks and mark allocations will vary. The notes are intended to inform the preparation for all papers, and are therefore not only related to one specific paper.

The comments on the responses are intended to support improved preparation for the assessment, through encouraging an understanding of the skills required. The information provided is not intended to indicate what is a perfect, model answer as the activities can often be approached in different ways and with outcomes that look a little different. More important is that learners demonstrate the appropriate range of skills using ICT tools and features in the applications they have chosen to use.

Levels of response - Response A and Response B

The sample responses show different levels of performance. 'Response A' shows a good level of response from the learner, with a high or full mark likely. 'Response B' shows a response with some weaknesses or omissions that will result in the loss of marks, and demonstrates common weaknesses that are seen in live assessments.

Scenario:

The manager of a local technology store, Mr White, has asked you to help with some IT tasks. He wants you to help him produce a newsletter. You will need to work on sales data and produce the newsletter article.

Question 2: Develop information about smartphone sales

Mr White wants you to help him produce a newsletter. He wants the newsletter to tell customers which types of smartphone are the best sellers. He wants you to work this out from the company's monthly sales data.

You will need to open and use the file **monthliesales.xls**

2a Use the facilities on your software application to work out and display:

- the total smartphone sales each month
- the total annual sales for each smartphone type
- the total smartphone sales for the year.

2c Use the formatting facilities on your software application to highlight the smartphone type with the highest annual sales, and the smartphone type with the lowest annual sales.

2d Mr White wants to know how the sales for each type of smartphone compare. Create a chart showing the total annual sales for each smartphone type.

Marks available: 12

Response A:

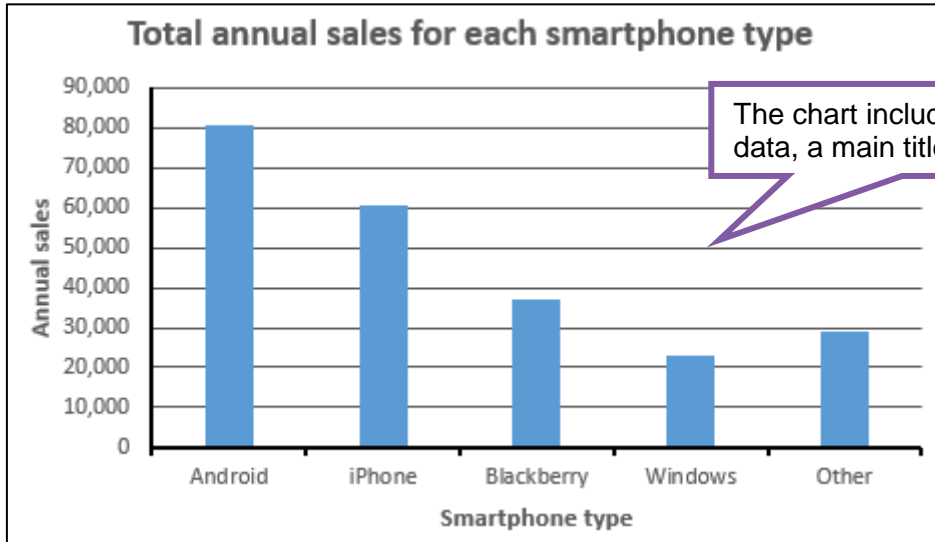
	A	B	C	D	E	F	G	H
1	Monthly sales by smartphone type							
2	Month No.	Android	iPhone	Blackberry	Windows	Other		
3	1	6,091	4,499	2,314	1,391	1,797	16,092	
4	2	6,126	4,520	3,165	1,662	2,077	17,550	
5	3	6,685	5,309	3,102	1,849	1,971	18,916	
6	4	6,963	4,801	3,203	1,880	2,110	18,957	
7	5	7,032	5,250	2,808	1,673	2,496	19,259	
8	6	6,683	4,719	2,954	2,048	2,323	18,727	
9	7	7,103	5,462	2,578	1,947	2,233	19,323	
10	8	7,002	5,462	2,668	1,879	2,214	19,225	
11	9	6,545	4,746	3,477	1,941	3,027	19,736	
12	10	6,576	5,358	3,466	1,887	2,436	19,723	
13	11	7,124	5,041	3,696	2,377	3,163	21,401	
14	12	6,997	5,375	3,827	2,302	3,217	21,718	
15	Totals	80,927	60,542	37,258	22,836	29,064	230,627	Annual Total

	A	B	C	D	E	F	G	H
1	Monthly sales by smartphone type							
2	Month No.	Android	iPhone	Blackberry	Windows	Other		
3	1	6091	4499	2314	1391	1797	=SUM(B3:F3)	
4	2	6126	4520	3165	1662	2077	=SUM(B4:F4)	
5	3	6685	5309	3102	1849	1971	=SUM(B5:F5)	
6	4	6963	4801	3203	1880	2110	=SUM(B6:F6)	
7	5	7032	5250	2808	1673	2496	=SUM(B7:F7)	
8	6	6683	4719	2954	2048	2323	=SUM(B8:F8)	
9	7	7103	5462	2578	1947	2233	=SUM(B9:F9)	
10	8	7002	5462	2668	1879	2214	=SUM(B10:F10)	
11	9	6545	4746	3477	1941	3027	=SUM(B11:F11)	
12	10	6576	5358	3466	1887	2436	=SUM(B12:F12)	
13	11	7124	5041	3696	2377	3163	=SUM(B13:F13)	
14	12	6997	5375	3827	2302	3217	=SUM(B14:F14)	
15	Totals	=SUM(B3:B14)	=SUM(C3:C14)	=SUM(D3:D14)	=SUM(E3:E14)	=SUM(F3:F14)	=SUM(G3:G14)	Annual Total

This example is a completed spreadsheet for the activity. Features that will be awarded marks are:

- a replicated formula is used to calculate totals for each month
- a replicated formula is used to calculate totals for each smartphone
- a formula is used to calculate the overall total sales
- specified data is highlighted

The formulae are expected to make use of cell ranges, eg =SUM(B3:F3), rather than =B3+C3+D3+... . Formulae should be replicated effectively across the cells. Learners must show methods of calculation. In the online assessments this is visible, but in paper-based assessments the learners must change the view to show formulae and print.



The chart includes the correct data, a main title and axes

Examiner comment:

Marks available: 12	Marks awarded: 12
Full marks shown in ()	
Reasons:	
<ul style="list-style-type: none"> • Totals for each month calculated using a replicated formula – 2 marks (2) • Totals for each type of smartphone calculated, using a replicated formula – 2 marks (2) • Totals of all sales calculated using a formula – 2 marks (2) • The smartphones with the highest and lowest sales are highlighted – 2 marks (2) • Chart produced to show the annual totals for each smartphone type with appropriate axes labels – 2 marks (2) • Chart main title and axes titles are appropriate – 2 marks (2) 	

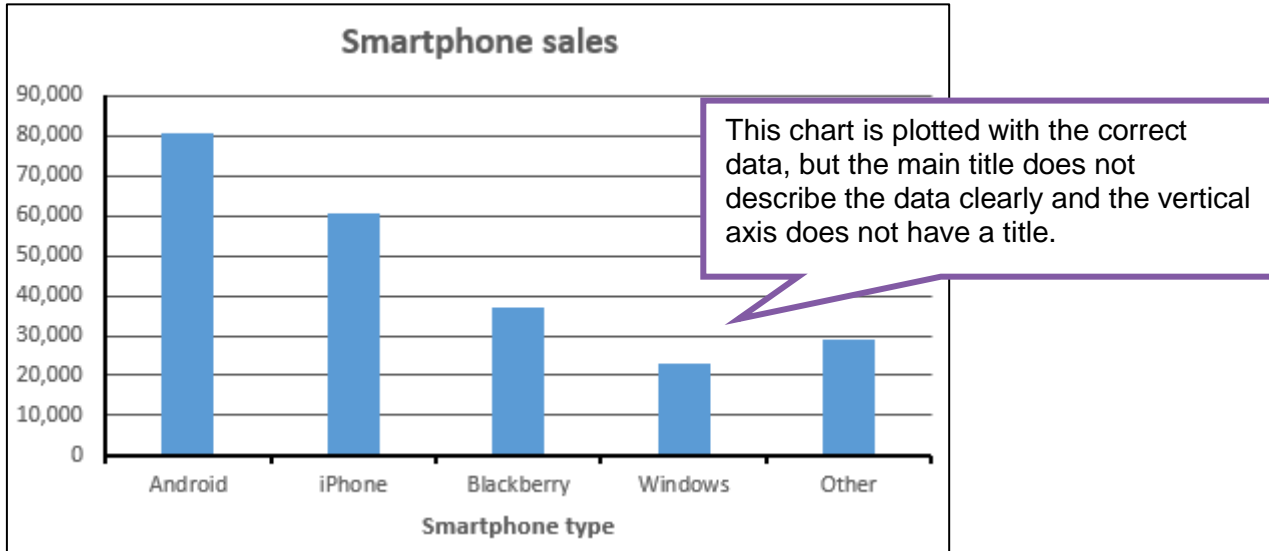
Response B:

	A	B	C	D	E	F	G
1	Monthly sales by smartphone type						
2	Month No.	Android	iPhone	Blackberry	Windows	Other	
3	1	6,091	4,499	2,314	1,391	1,797	16,093
4	2	6,126	4,520	3,165	1,662	2,077	17,552
5	3	6,685	5,309	3,102	1,849	1,971	18,919
6	4	6,963	4,801	3,203	1,880	2,110	18,961
7	5	7,032	5,250	2,808	1,673	2,496	19,264
8	6	6,683	4,719	2,954	2,048	2,323	18,733
9	7	7,103	5,462	2,578	1,947	2,233	19,330
10	8	7,002	5,462	2,668	1,879	2,214	19,233
11	9	6,545	4,746	3,477	1,941	3,027	19,745
12	10	6,576	5,358	3,466	1,887	2,436	19,733
13	11	7,124	5,041	3,696	2,377	3,163	21,412
14	12	6,997	5,375	3,827	2,302	3,217	21,730
15	Totals	80,927	60,542	37,258	22,836	29,064	230,705

	A	B	C	D	E	F	G
1	Monthly sales by smartphone type						
2	Month No.	Android	iPhone	Blackberry	Windows	Other	
3	1	6091	4499	2314	1391	1797	=SUM(A3:F3)
4	2	6126	4520	3165	1662	2077	=SUM(A4:F4)
5	3	6685	5309	3102	1849	1971	=SUM(A5:F5)
6	4	6963	4801	3203	1880	2110	=SUM(A6:F6)
7	5	7032	5250	2808	1673	2496	=SUM(A7:F7)
8	6	6683	4719	2954	2048	2323	=SUM(A8:F8)
9	7	7103	5462	2578	1947	2233	=SUM(A9:F9)
10	8	7002	5462	2668	1879	2214	=SUM(A10:F10)
11	9	6545	4746	3477	1941	3027	=SUM(A11:F11)
12	10	6576	5358	3466	1887	2436	=SUM(A12:F12)
13	11	7124	5041	3696	2377	3163	=SUM(A13:F13)
14	12	6997	5375	3827	2302	3217	=SUM(A14:F14)
15	Totals	=B3+B4+B5+B6+B7+B8+B9+	=C3+C4+C	=D3+D4+D5+	=E3+E4+E5+	=F3+F4+	230705

In this example, marks are lost due to:

- cell references rather than a cell range, eg B3+B4+B5.. rather than B3:B14 . The use of a cell range is good practice as it is much quicker to enter than discrete cell references
- values used rather than a cell reference. eg the 230705 value is calculated



Examiner comment:

Marks available: 12	Marks awarded: 5
Full marks shown in ()	
Reasons:	
<ul style="list-style-type: none"> • Totals for each month calculated with a formula, but error in the cell range, eg A3:F3 rather than B3:F3 – 1 mark (2) • Totals for each smartphone calculated but not using an efficient cell range – 1 mark (2) • Totals of all sales calculated manually – 0 marks (2) • Only one set of data highlighted – 1 mark (2) • Chart produced to show the annual totals for each smartphone type with appropriate axes labels – 2 marks (2) • Chart main title should refer to the time period and there is no y-axis title – 0 marks (2) 	

Examiner guidance on using formulae:

The qualification specifications are not prescriptive on what formulae should be used. It is more important that the methods used are appropriate for the problem and required solution.

Formulae could include:

- Addition, subtraction, multiplication and division
- Average (mean)
- Maximum, minimum
- Percentages

Important points to note:

- All formulae must use cell references rather than values, to allow results to be automatically updated, and to support replication. An exception can be when a fixed value is used and is not already present in another cell
- =SUM is only used for addition
- Cell ranges should be defined, e.g. B2:B8, rather than B2+B3+B4+B5 etc.

Examiner tip:

Working with numbers and calculations: The obvious choice for such work is a spreadsheet. Candidates should be familiar with the use of formulae and cell references. Candidates often put 'SUM' at the start of any formula, but depending on the level, candidates should understand the different formulae for calculating additions, multiplications, divisions, maximum/minimum, averages and percentages.

Charts and graphs: Many candidates are not fluent in the use of axes titles or data labels. The result is charts that only give part of the required information.