

# Examiners' Report

January 2017

Pearson Edexcel Functional Skills  
Mathematics Level 2 (FSM02)

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## Introduction

A number of learners produced some excellent and thoughtful responses. However, judging by the blank pages, some learners had clear gaps in their knowledge or did not apply a strategic approach to answering the questions by moving onto questions they found easier. Using inefficient build-up methods slowed many learners down. Centres should encourage learners to focus more on multi-step questions which are often worth more marks and to attempt all questions in the paper.

There were fewer arithmetical errors seen in learners' responses which shows that they had access to and used calculators. However, a rather large cohort used the build-up method when working out percentage of an amount or converting between units. This method is valid but inefficient as it has many stages in which errors may occur. It is strongly advised that learners take advantage of their access to calculators and use them in all questions where calculations are required.

The majority of learners presented their working throughout each question but there were a few instances where the calculations were not clearly organised or simply missing. Marks are awarded for processes so it is paramount that all calculations are shown. Learners should be encouraged to present all their calculations, however simple, and do so in an organised and logical order. It is also critical that learners state their decision clearly (Yes or No usually suffices) as at least one mark in every question is awarded for correct conclusion accompanied by accurate figures. Accurate figures also require showing the units they are working with, i.e. cm, £, minutes etc. It was especially clear in this paper that many learners could not convert between units or disregarded them and arrived at incorrect conclusions.

Learners engaged with a variety of contexts and responded to tasks in most cases. However, there were some instances where learners misinterpreted the results of their calculations and their final answer was incorrect. Learners should be encouraged to carefully consider the context, practise extracting essential information (highlighting key data is advisable) and focus on what the demand asks for when making their final decision. It is very important that they use their common sense when giving the final answer to check if it makes sense. Some learners believed that using thousands of chocolate bars to make chocolate mousse or that running thousands of miles in 40 minutes were sensible answers. Many learners lost marks for failing to show a check of their calculations when explicitly asked to do so.

There are a few areas that the learners should particularly improve on. These include extracting data from tables and graphs, converting between units, especially of time as many incorrectly used decimals in their calculations, using rounding appropriately – some learners unnecessarily do so in the intermediate stages of their process which leads to inaccurate final decision.

## **Section A**

### **Question 1a**

This straightforward question asks to find discounted price by engaging with percentage. Far too many learners used inefficient build-up method and came unstuck when having to find 5%. Learners should be taught equivalence between percentages and decimals and then use calculators to find their accurate figures. The question also asks for the final price which means the final figure must be presented in correct money notation. Learners should remember that prices need to be shown to 2 decimal places and have £ symbol. It was pleasing to see that many learners showed a valid check in this question.

### **Question 1b**

When engaging with proportion, as this question requires, many learners were able to show the first couple of steps in their method but then often misinterpreted their figures and multiplied when they should have divided or rounded too early in their calculations and hence forfeited accuracy mark. Learners who used the unitary method were generally the most successful. It would also help if learners stated in words what they were calculating at each step e.g. amount of chocolate per person, amount of chocolate needed, number of bars needed. They are then less likely to get lost with where they are in the calculation. Many learners used a build-up method. Learners need to be encouraged to check whether their final answer is reasonable. Some concluded that to make the mousse they will need thousands of chocolate bars.

### **Question 2**

This question tests how well learners understand what an efficient data collection sheet is and asks for two improvements to the given order form. Some learners made comments that focussed on the format of the table (font size, width of columns, etc) rather than linked to a maths aspect. Careful reading of the question would have elicited the points needed. Learners should not waste time redrawing the entire table with their improvements when the question only asks for 2 comments.

### **Question 3a**

Converting between metric and imperial units proved a challenge to some learners. Again, many used the build-up method and often failed to complete it when they reached decimal parts. Some learners did not gain marks as they truncated unnecessarily or rounded too early, some missed the second part of the rule and did not add 20 minutes and some converted minutes into hours and minutes incorrectly and superfluously. Centres should encourage learners to carefully read the question so they do not miss any important steps or show redundant working. It is also important the learners remember to use consistent units throughout and state the units in their final answers.

### **Question 3b**

This question involved a very common and functional problem of fitting smaller cuboids into a larger one. Learners should be given practical experience with packing problems like this. Working out the volume of the cuboids is only valid for estimating or checking the answer. Learners who knew to divide the smaller into

the corresponding larger dimension often forgot about the 3-dimensionality aspect and added their three figures instead of multiplying them. Centres should teach this skill in practical context - sending parcels, working in warehouse etc. and explain that volume method is not the valid one.

## **Section B**

### **Question 4a**

Multistep problems like this one require strategic approach. Many learners could find a fraction and a percentage of a figure. However, too often they misinterpreted the information given in the question and worked out the cost for 2 rather than 4 people. Build-up method was frequently seen, and as in previous questions, it proved inefficient and led to many arithmetical errors. Centres should emphasise that finding equivalents of fractions and percentages in decimals will improve their chances of success as they will be able to use calculators rather than perform long and complex manual calculations. It is also essential that learners read questions carefully and engage with all information.

### **Question 4b**

Centres need to ensure learners have had the opportunity to work on questions analysing all the different types of graphs and charts expected at Level 2, the dual temp and% rain scale was misinterpreted. Some learners also presented only 1 figure where the question clearly asks for figures (plural).

### **Question 5**

Practical work on exchange rates would be useful when preparing for this type of questions. Maybe on a weekly basis, the rates can be looked up online and then conversions into pounds/euros/dollars can be worked out. This will also give the idea that these things change, so that it may be cheaper to buy online one week but in the shop the next. For some learners, the issue with this question was the interpretation of their numeric answer, where learners arrived at the correct numerical value and then declared 'online' as they had lost track of whether they were in Pounds or Euros. Using a structured layout such as a table or two columns with headings of £ / Euro may be helpful for learners to interpret their calculations correctly.

### **Question 6a**

A significant minority used a proportional approach and were generally successful. Working with 40 minutes as  $\frac{2}{3}$  of an hour, sixty, and calculating  $\frac{2}{3}$  of 6.5 miles was a successful approach. Or if they found the distance travelled in 10 minutes (or sometimes 1 or 20) and built back to 40 minutes, this was also successful. The rest of those, who did not use proportion, tried to use the speed/distance/time triangle but either recalled it incorrectly or did not understand how to use it. This may not be the best approach for this type of question. This is a topic that should appeal to learners who could use data from health apps or fitness gadgets. Plenty of scope for practice here.

**Question 6b**

The perennial problem of working with minutes and seconds was evident in the responses to this question. Too many learners were writing minutes and seconds using decimals, as if there were 100 seconds in 1 minute. Learners must be supported in working with all the time conversions possible; 3 minutes 24 seconds is not 3.24 on a calculator. There is a minute second key on most scientific calculators that centres do not seem to show learners how to use. Simple conversion of all minutes into seconds added to all the seconds then divided by 60 was the most efficient and successful approach. While it was encouraging that learners understood how to work out a mean too many still struggle when working with time.

## **Section C**

### **Question 7a**

This question tests the use of formula, converting between litres and  $\text{cm}^3$  and use of powers. While most learners were able to show correct conversion, and begin to substitute into the formula, many still lack the skill to show the correct calculations that the formulae required. To limit errors on substitution questions, centres could use an activity and advise students that when working with formulae they should expand them and put back in all the x signs and break powers down. Some learners do not understand that any number, which is part of the formula, must stay in the formula when the substitution is done: in this case the 0.8. Function machines are very helpful in working out the result of a substitution and also then using them in reverse as a check.

### **Question 7b**

For probability, there are only 3 accepted forms for the answer – as a fraction, decimal or percentage. Use of 'out of', 'in' or ratio is not acceptable. In this question, learners were specifically asked for a fraction, in its lowest terms. Some failed to simplify their correct initial fraction which should be a skill taught by the centres.

### **Question 8**

It was encouraging to see many learners engaging with scale 1:10 correctly. Yet, many only completed the first part of the question by producing a correct scaled diagram and did not measure the slope length or convert it into a real-life dimension. It is advised that learners read the question carefully and provide evidence that answers all aspects of the question. Centres may want to use 3 or 4 different scales for each layout with their learners so they can easily compare how the dimension of each item and area changes as the scale changes. Practical activities for scale drawing can include designing a room or using pictures from catalogues.

### **Question 9**

Area and perimeter are too often confused. Practical activities could include carpeting a floor with square carpet tiles and working out e.g. how much tape would need to go around the edge of the room to fix the tiles. The expression 'perimeter fence' could be used to reinforce the meaning of perimeter. Learners could measure the fence round the playground for example. This question would have benefitted from the learners annotating the diagram to show any missing/required lengths. Most learners were able to find the missing dimension and one relevant area but some failed to add correct areas together. Advise learners to annotate the existing diagram on the paper as a visual aid to see their progress through the question.





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