Principal Examiners' Report November 2010

FS

Functional Mathematics Level 2 (FSM02)

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November 2010

Publications Code FC025873

FSM02 - Functional Skills Mathematics Level 2

Introduction

Candidates must ensure that the process of how they come to an answer is clearly shown as functionality is so open there is more than one way to get to answer and that rarely is it the case that only one way and one answer is acceptable. For instance when multiplying or dividing the process of repeated addition is perfectly acceptable as a method and the process of how the answer is achieved, as this is often what we would do in real life.

Centres should therefore ensure that all preparation for functional mathematics is very much real life situations and not those that are made up out of a contrived situation. Candidates should ensure that even though they are using a calculator they should show all stages in their working that they have done. As many processes can be varied it becomes even more important that whatever the calculations they are doing, candidates write down each stage they have done clearly, so that credit can be given. In a number of cases throughout a question paper, a correct answer written down, without working, may only be credited with one mark, when the whole question may be worth 4 or even 5 marks. It is here that the process marks are important and must be shown.

A large proportion of students did not appear to have a calculator, and were attempting paper and pencil methods for calculations (usually unsuccessfully). Although evidence of the process could be awarded, it was these methods that resulted in students not getting the correct answer. It would be helpful that centres ensure that students are equipped correctly, especially that functional maths is a calculator exam.

Many of the students who did use calculators wrote down their final answers without showing the calculation which they were performing. Clear presentation of solutions would help the students see which steps they needed to perform.

Students should, (as always), be encouraged to consider whether or not their final answer is sensible.

Question 1.

Q1(a)
Generally well done, some used division some used multiplication or repeated addition, the majority rounded correctly. Most were able to show 3 widths, but should be encouraged to show their calculations ie 112÷37.

Some candidates failed to understand that left over fabric is unwanted so an answer of 3.0... , meant that only 3 could be achieved, clearly candidates need to experience real life situations of this type.

Not always rounding mathematically is not always a sensible answer and students need to experience sensible reasoning when it comes to rounding.

Repeated addition (37 + 37 + 37) was a very common method to make up to 111, and in few cases diagrams were seen, all of which were acceptable process skills.

Q1 (b)
Generally poorly done, with the majority of candidates unable to process correctly what was required.

Students need to be able to convert between metric units more successfully; 22m = 220cm was commonly seen. It is clear that students are unfamiliar with the idea when two measurements are given but in different units, practical situations do require us to operate functionally between different units of measurement, therefore students need to be familiar in changing between different units of length, in this case between cm and m or vice-versa, this could be a common occurrence in functional skills.

They should also be encouraged to write down clearly the calculations of the processes they are conducting, as many students did not use all of the information needed for the answer. A common error was giving the number of strips that could be cut from the material, rather than the number of cushions made.

Many students used the area method to get an answer of 89. Although this process is commonly used for many mensuration problems, it was not appropriate for this question. Few then remembered that they got 3 squares across the width of the fabric and that 2 squares were needed for each cushion.

Question 2.

Q2(a)
Generally well done with students being able to process correctly how many cushions could be made in a day, though it was not uncommon for this to result in 7 cushions in one day. Although acceptable, students clearly need to work functionally on real life use of maths, as there is nothing wrong with 7.2 cushions a day. In a workshop, staff would quite happily finish for the day with one cushion not quite complete and then complete it the following day.

A lot of correct processes were seen either dealing with the total time needed of 120 x 50 minutes then ÷ (60 x 6) for the full answer or by 6 x 60 ÷ 50, in which case this showed the number of cushions that could be made per day. Showing the calculation to get "7.2 cushions per day so...." , clearly demonstrated understanding, and it is this that should be encouraged by centres. It was here that some students guessed that they could make 1 cushion per hour, not realising that the extra 10 minutes could be added on to make an extra cushion per day.

It was disappointing to see some students thought there were 100 minutes in an hour.

Q2 (b)
Many good answers were seen here with many students being able to process the information correctly to at least start the solution to the problem.

Many students found the total cost for making the cushions, rather than the cost for one cushion first. Many candidates did not add the fabric cost to the other costs of making a cushion or the cushions. Processing the required profit of 50% was very variable, with lots of students showing clearly what they were doing with labelling the 50%. This was either as build up from 10% and then x 5, or with ÷ 2. Other students showed x 2 for 50%, with a number failing to add the profit on. A few students worked with x 1.5. Very few didn't write the answer in correct money notation, leaving their answer as 15.925.

Question 3.

Q3(a)
Again, this question was generally done well, with students being able to process the idea of the mileage and the charge for this then the separate charge per hour. In some cases , students decided to add the mileage together rather than consider that before and after means a difference is needed. Some students failed to realise that the charge was in pounds and the mileage was in pence, again like with question 1b, students need to experience units in the same system, as in £ and p, and thus be able to convert when needed.

The actual calculations were generally well done although some astronomic delivery charges (over £1000) were seen. Candidates should be looking critically at their answers, and consider the reasonableness of their solution, this often comes about through real life experiences, but nonetheless , centres should allow students to consider this in their preparation for functional maths.

Q3(b)
While many people did do a reverse calculation (often only one) many repeated the calculation, or said to "use the calculator", or didn't attempt this part. Centres should prepare students for correct mathematical checking and either a reverse calculation or estimation is considered to be a reasonable check.

A **repeat** of a calculation they have used is considered to be an **incorrect** check. This sort of checking question will occur on most functional maths papers and centres should ensure students are prepared for this.

Question 4.

Q4.
The most successful candidates recognised that consistency could be judged by using the range of the runner's times. There was also some success in comparing the differences between the races on a week by week basis for each runner and, in the best responses, working out the average difference. A few candidates successfully compared the rank of the runners for each week.

However it was clear that many of the candidates did not understand the concept of consistency and used the average values for the runners as a basis for the comparison. Often, in this case, candidates considered the 'best' runner as the one with the highest time, making two errors. One that consistency means the 'best' and second that the highest time in a race is the best time.

Many candidates were unable to work successfully with time and obtained their answers by calculating time as a decimal. Practice in working with time in context is recommended and the introduction of the degrees, minutes and seconds button on a scientific calculator for those with persistent difficulties may be beneficial.

Quite a high number of candidates made appropriate written comments e.g. David's had almost the same times but did not provide any numerical evidence to support the statements and therefore scoring no marks.

Question 5.

Q5a.
This question was well answered though some candidates were not awarded the second mark, as working out had not been demonstrated. Candidates should be reminded to show their process when presenting their answers particularly when the question is worth more than one mark.

Weaker candidates repeated the information that was given or added the numbers for each time period rather than finding a total fluid intake.

Q5b.
Most candidates were able to link multiples of 15 minutes in 3 hours and the amount of water needed per 15 minutes. Calculating the total number of bottles required was not always clearly shown.

A significant number of candidates did not show their process clearly throughout this question which meant that marks were lost despite the candidate giving a correct answer. Candidates did not use calculators effectively for this question and poor number skills were evident as many used compound addition and compound subtraction in their working out.

Question 6.

Q6.
Many candidates did not attempt this question at all, of those that did few were able to work competently with the formula and substitution was poor. The majority of those attempting the question gained marks for either 400 – value, divide by 2 or 6.28 x 38, 238, 239 but not both.

A few candidates successfully applied a trail and improvement method to a partially substituted formula. Those that were competent provided excellent solutions and in the best cases transposed the formula before substitution.

Some candidates were confused by the +2 in the expression 6.28R +2T and multiplied the R value by 2. This often occurred after the R had been multiplied by 6.28; therefore erroneously carrying out two processes on the R.

A significant number of candidates did not divide their final answer by 2; a consideration of the size of their answer compared to the length of the running track might have prevented this error.

Question 7.

Q7a.
Most of the candidates were able to make progress with this question. Candidates were asked to design a suitable table to compare the monthly running costs of a car; however, a minority of candidates tried to use a bar chart to display the data. Candidates should be encouraged to read the questions carefully and identify the key features. Designing tables for data capture have featured regularly in the pilot and it could help if more emphasis were placed on the use of two-way tables and their use in real life.

Candidates were generally accurate when transcribing the information into their table; however, a minority tried to average the different aspects of the costs across all 6 months which meant they were unable to compare the running costs month by month for the two cars.

Q7b.
Candidates were asked to write two statements to compare the monthly running costs. Many successfully gave one statement comparing the running costs e.g. running cost for Q is less than running cost for P, but then simply reversed this for their second statement. Others made statements about the costs but did not make a comparison. Candidates must be made aware of the requirements of a 'comparison' question.

Question 8

Q8.
This question was generally well answered. Most candidates seem to have been well prepared to tackle 'best buy' questions. The main errors that occurred were in misunderstanding the nature of a deposit for a car. A number of candidates subtracted the deposit from the cost of the monthly payments when finding the total cost. Candidates were given credit for identifying the cheapest price based on their own calculations. This again demonstrates the importance of the process in candidate working.

Question 9.

Q9a.
This question was generally tackled well by candidates. The majority used a scatter graph approach although a significant minority produced a bar chart. Candidates should be reminded of the need to label axes appropriately, using suitable units. Many omitted to identify the cost was in pounds. Some candidates did not use linear scales on both axes, and some used difficult scales which made plotting harder, whereas others had scales which went off the grid. Practice in choosing scales for given intervals which are linear, suitable for the size of the grid and with sensible intervals would be useful to candidates.

Q9b.
This question was well answered by most candidates, either by reading their graph or interpolating from the table to get £4175. Some who used the graph clearly showed how they had obtained their answer with appropriate lines drawn in, but some candidates' attempts at finding a midpoint went astray. An error seen several times involved finding the difference between the values at Year 2 and Year 3, halving it then adding it to the Year 3 value instead of subtracting. Stressing to candidates that they should check their answer makes sense would help avoid this type of error.

Pass mark for FSM02

Maximum mark	**48**
Pass mark	**30**
UMS mark	**6**

Note: Grade boundaries vary from year to year and from subject to subject, depending on the demands of the questions.

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Order Code FC025873 November 2010

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