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Examiners' Report

February 2018

Pearson Edexcel Functional Skills Mathematics Level 2 (FSM02)

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Introduction

This Level 2 paper set questions in 3 contexts: adventure holiday, coffee shops and building. Most learners attempted the majority of questions and provided functional and thoughtful answers to the problems set.

General comments

While the majority of learners found the paper accessible, there was evidence from the number of blank responses at the end of the section C that some of them ran out of time. This may indicate that some learners may have been entered for the wrong level or had little preparation. The centres should also encourage learners to adopt a systematic approach to answering the questions by having a quick run through the paper and completing the questions they find more accessible first. Many learners did show their working clearly and were consequently able to obtain process marks. There is evidence, however, that some learners did not have access to appropriate and required equipment (i.e. ruler, protractor, pair of compasses, calculator). Centres must ensure that these are readily available during the examination and learners must be encouraged to use them as they aid providing accurate answers.

This Level 2 qualification tests the ability to deal with multi-step problems in unfamiliar context. Success in these can only be achieved if learners read the information provided very carefully. In most cases when learners did not achieve full marks, it was due to missing vital pieces of information or not following the instruction in full. Often, having completed the correct calculations, some learners failed to write a conclusion or came to the wrong conclusion. On completing a question, learners should be encouraged to re-read the question to ensure they can make a valid decision. Centres should encourage learners to underline or highlight relevant information and double check if they have engaged with all constraints. It is recommended that learners are taught to use the given information as a check list and tick off the data to ensure they have taken everything into account. They should also practise using a consistent and logical approach to answering questions, showing all relevant working and providing final answers in correct units including money notation.

Accuracy to a given or appropriate degree is vital to a successful completion of the paper. Rounding/truncating the answers should occur at the final stage. Centres need to show learners the amount of accuracy that is lost by rounding values at the beginning of calculations. They could provide calculations with several steps and look at what happens when rounding occurs at different stages in the calculation and the difference in the answers. It would also be useful to ensure that learners know how to use a calculator properly and

understand that most calculators follow the rules of BIDMAS. It was surprising to see that only few learners were able to round to two decimal places correctly. Centres should practise this skill more often with learners in contexts where this level of accuracy is functional.

The most tenacious errors learners made in this series included confusing area and volume, inability to design and complete fully efficient two-way table, engaging with proportion in functional context, working out fraction or percentage of a given value and constructing accurate geometrical shapes. Moreover, many learners prematurely rounded their figures, did not state the units they were working in and failed to provide a valid check of their working. Centres should point out to learners that many marks can be gained by providing thorough and clear calculations in every question and in every stage of their working.

Section A

Question 1

In this straightforward question learners needed to work with a negative number. While most learners attempted this question, there was some confusion as to how to write out the calculation they needed to perform. Many used a number line that helped them find the correct answer but then were unable to show a valid check by means of showing an alternative method, i.e. correct calculation.

Centres should stress the importance of checking work and ensure learners have practice at using positive and negative numbers in a variety of situations. Learners need to be made aware that when using a number line they count the gaps and not the actual numbers. Additionally, the importance of providing a valid check should be stressed as too many learners ignore this requirement.

Question 2

This multistep problem, which required currency conversion and working out a complex percentage of a given value, was attempted by a clear majority of learners. The most common mistakes involved inability to find 2.75% of 2000, unnecessarily finding the value with the percentage subtracted and multiplying instead of dividing when converting the currencies. Quite a few attempted the question by using a build-up method. While this approach is correct, it is inefficient and often leads to lapses in accuracy and should not be encouraged in questions that deal with complex percentages, especially as there is more evidence that learners increasingly use calculators correctly in these questions.

As this question required accuracy to 2 decimal places and stating the final answer in correct money notation, centres could show learners the impact rounding early has on their final answer and ensure they know the correct way to write money. Learners should always express money answers correct to the nearest penny and include £ sign. Additionally, centres need to ensure learners understand how conversions work. It is useful to show them the following: when given any conversion in the form 1 = 12.74 draw an arc above with a multiplication sign on it and an arrow from left to right and an arc underneath with a division sign and an arrow from right to left. So if they follow the direction of the arrows and the instruction they will always multiply or divide correctly when changing from one set of units to another.

Question 3a

Designing an efficient two-way table to collect and summarise data is a skill tested in almost every paper but still many learners struggle to create a table that is functional. Too many learners provided either the exact copy of the given table or use headings inefficiently. Some also drew bar charts and pie charts which are not appropriate.

Centres could give learners practice by giving them the opportunity to design and carry out their own surveys, then collate their data in an efficient 2-way table. They could have further practice by collating each other's data and double check whether each cell of the table collates information from each relevant subcategory – in this question each cell had to collate information for specific subcategory of gender, age and number of trips.

Question 3b

This practical problem involved reading comprehension more than any other skill. While it generally was well done, and many learners were able to redistribute the weights, some did not use all of the free allowance or left one of the bags slightly overweight. Calculating the excess baggage charges proved to be problematic for some learners as they did not take into account the free allowance. Some also gave their final answer in £ not euros.

Centres need to teach learners to think logically and read all the information carefully before starting to write their answer. In this particular problem, a good idea would be to check the total weight of their luggage was the same after swapping as it was to begin with and that the full advantage of free allowance was taken.

Section B

Question 4a

This question tested working with averages and most learners answered it well. It was encouraging to see attempts at both mean and median in this question. However, too many learners failed to provide any check of their answer.

Centres should stress to learners that there are at least 3 marks in each paper that can be gained for providing a valid check and that these should not be ignored.

Question 4b

Many learners seemed to struggle with this question. The first step of finding a range proved surprisingly challenging to a few learners as they were either unable to identify two extreme values or showed process to find median rather than range. The next stage was using the formula given and while most learners were able to substitute their values into the formula correctly they did not show the full process leading to their answer.

Centres need to ensure learners have practice at substituting in formulae and knowing what signs are missed out in formulae that need to be replaced when values are substituted in, e.g. knowing that 100R means 100 x R and that their product should be divided by the value in the denominator. Centres should also encourage learners to break the question down into smaller chunks when attempting multi-layered problems and practise all aspects of statistical measures at this level.

Question 4c

Evaluation and reasoning are an integral part of the level 2 specification. In this question learners were asked to comment on the effect the size of the data set has on statistical measures. Many clearly recognised that the more representative and reliable set of data was that for a whole month. Sadly, a minority were able to provide valid reason for their decision.

Centres should explain to learners that choice of the data set has an impact on the result of calculations and should set more practical tasks that shows this impact. They should also practise providing explanation for their decisions in the form of simple statements.

Question 5

Level 2 learners need to be able to engage with multistep problems by carefully considering all aspect of the question and adopting systematic approach in their calculations. In this question, they needed to interpret the ratio, find total income from each sale and find a third of the total. Many learners did not know how to interpret the given ratio and many used 30% to find a third.

Centres need to give learners practice at working logically through more complex wordy problems by encouraging them to tick off each piece of information as it is used. Moreover, they should explain that when finding a fraction of a value they need to divide by the denominator rather than attempt to convert to percentage.

Question 6

Another question which required careful reading of the constraints involved setting a rota for 5 staff. Many learners successfully provided a rota with only one error. However, it was evident that only some learners double checked their response.

Centres should set learners more practical problems involving scheduling and requiring to split shifts to meet all constraints.

Section C

Question 7a

In this question, as in other multistep problems, reading the information carefully is essential. Most learners attempted this question but gained only partial marks. The most common errors included working out volume rather than area, forgetting to use ¾ in their final calculations or not using the total area to find figures to compare. It was encouraging to see many learners being able to work with proportion, yet this was only one of five processes needed here.

Centres need to stress the importance of reading the question very carefully and highlighting in some way all the relevant information, perhaps ticking off each item as it is used. Moreover, more practice is needed to explain the difference between area, perimeter and volume. Centres should set more practical tasks that highlight which of the three is appropriate to use, i.e. difference between 1, 2 and 3 dimensions.

Question 7b

It was reassuring to see many learners able to engage with complex ratio in this question. However, many failed to provide full process, often forgetting to multiply by 2 and only a few were able to show their final answer correctly rounded to 2 decimal places. Again, many ignored the check requirement.

Centres need to give learners practice at rounding final figures to correct degree of accuracy and explain that truncating is not equal to rounding and highlight the importance of showing a check.

Question 8

Many learners were able to show correct process to find the volume and show a process to find relevant figures to compare. However, some still confused volume with perimeter and provided incorrect conclusion to their calculations.

Centres should enable learners to practise volume, area and perimeter and their practical applications as well as highlighting the need to double check if their final answer makes sense.

Question 9a and 9b

Asking learners to create a scale drawing is a skill tested in nearly every examination paper. It was encouraging to see that significant majority of learners were able to identify correct scale. Some confused the way it should be written and instead of 1:10 wrote 10:1. The diagram of regular hexagon was often attempted which indicated that most of the cohort were aware of what a hexagon is and its features. However, very few diagrams were accurate enough to warrant all the marks. There was some evidence that learners did not have access to rulers, protractors or pair of compasses and some diagrams were clearly freehand sketches.

Centres must ensure that all required equipment is provided to the learners and encourage the learners to use them. They should also practise more scale drawings with variety of common 2-D shapes and scales.