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Examiners' Report

January 2018

Pearson Edexcel Functional Skills Mathematics Level 2 (FSM02)

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Introduction

This Level 2 paper set questions in 3 contexts: entertainment park, collecting coins and meeting venue.

General comments

Overall learners found the paper accessible, despite some less familiar contexts. While the majority of learners attempted each question, there were some blank responses which would indicate that they had been entered either for the wrong level or with very little preparation. There is also evidence that some learners did not have access to appropriate and required equipment (i.e. ruler, protractor, 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.

Level 2 specifications require 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. 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 or money notation.

Accuracy is also key to a successful completion of the paper. Rounding/truncating the answers should occur at the final stage and to an appropriate degree of accuracy. 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.

The Level 2 aspects where most persistent errors occurred include confusing area and perimeter, inability to work out the amount after fractional and percentage discount, incorrect rounding to the nearest whole number, not showing units or correct money notations in the final answer and not showing a valid check of their working. In this particular paper the concepts of drawing a functional net of a cuboid and of producing a simple pie chart proved particularly challenging and are indicative of a need to practise them more in the classroom. Centres should focus on less frequently tested aspects of the curriculum in the lessons and assure that the full curriculum is taught.

Section A

Question 1a

Working with time and money in this question proved very accessible and most learners gained all 3 marks. The most common error was when a learner did not read the question fully and assumed they worked 7 days a week instead of the 5 stated. Some learners also forgot the unpaid lunch hour.

Centres could teach learners to use a timeline with “bunnyhops” linking each number to ensure that learners count the gaps rather than the actual numbers when finding the time elapsed. Also practice of underlining the key information will help in ensuring that all aspects of the question are considered.

Question 1b

Creating an efficient data summary sheet is tested frequently and while the majority of learners attempted this question, quite a few failed to show a two-way table that would capture all the data or created a questionnaire instead. Some learners lost marks because they omitted the more than and less than criteria in their headings.

Centres need to focus on developing learners’ skills in this area. Learners need to practise using and drawing 2-way tables with 3 different types of data for a variety of situations. They need to steer learners away from column headings and questionnaires. It would be beneficial to set practical task of collecting various data from classmates and presenting it in a data summary sheet.

Question 1c

This question tested the ability to work out a mean and to round the answer to the nearest whole number. Most learners attempted this question with a significant number gaining full marks. Some learners attempted to find the median, others found the mean successfully but were unable to round the value correctly often truncating the answer or rounding to the nearest hundred or thousand. A few learners had the correct process but an incorrect answer because they were unable to use a calculator properly and maybe unaware that most calculators (except very basic ones) follow the rules of BIDMAS.

Centres need to reinforce the difference between mean/median/mode and give learners plenty of practice at finding all of them for different types of data. They should ensure that all learners know how to use their calculators. Centres also need to ensure that learners know how to round values to decimal places, significant figures , whole numbers, tens, thousands etc. One number could be rounded to all of these to see the different answers.

Question 2a

Most learners attempted this question; however, some confused area with perimeter, and others found the actual area and ignored the fact they were asked for an estimation or omitted the units or gave incorrect units.

Centres need to teach learners the difference between perimeter/area/volume and the units that go with each and then give plenty of practice at finding them including the units. Learners could round the values in the practice questions to give an estimation of the answer and to check whether their answer is sensible. Centres could teach learners to use estimation to check whether their answers are sensible for most problems and to look at how different ways of rounding causes either an over or under estimation. Some learners did not appear to understand the terms underestimate and overestimate and therefore estimation is a topic that requires further work in centres.

Question 2b

Many learners answered just over or under estimation without giving a reason why. Following on from Question 2a learners should be able to see what happens when they round values up or down before completing the relevant calculation.

It is also important to involve mathematics as well as the context of the question to justify a decision. In this question some learners rounded one value up and the other down and were unable to explain how this affected their estimation. Others, provided explanation that had nothing to do with their calculations.

Question 3

This multistep problem set in a familiar context was attempted by a clear majority of learners who were able to identify the correct ticket prices from the table and find total including hotel costs. The most common errors were, incorrect money notation in their final figure, forgetting to apply the 37% discount or an inability to work out 37%. A few used the wrong values from the table or included 2 child tickets instead of 1.

Centres need to stress the importance of adding a zero (or rounding to 2 decimal places) to money calculations done on a calculator. Learners must understand how money is written correctly to aid communication of figures. Centres need to reiterate the significance of reading the question very carefully and highlighting in some way all the relevant information. More practice is needed at finding a percentage of a quantity then turning it into a percentage increase or decrease.

Use of a calculator is very useful here as all they need to be taught to do is to divide the percentage figure by 100 and multiply the quotient by the figure they are finding the percentage of. Too many attempts of inefficient build up method (i.e. finding 50%, then 10% then 1% and putting a combination of them together to find the final value) are seen and they often are inaccurate.

Section B

Question 4a

This question tested reading values off a line graph and using a formula and most learners were able to provide full process. The most common errors were using the incorrect values from the graph, incorrect use of the calculator or not following BIDMAS or making the wrong (or no) decision.

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. Reading values off different graphs and charts should also be practised, especially when understanding the linear scale is involved.

Question 4b

Most learners attempted this question and overall it was answered well. While most were able to find a fifth or 13% of the given values, some were unable to or unaware of the need to add these on to original values to find accurate figures to compare.

Centres need to ensure that learners are confident with basic fractions and percentages and stress the importance of actually giving a decision. Using a build-up method in finding 13% is challenging and often leads to inaccurate answers. It was clear that some learners did not understand what a deposit was – some thought that this was returned to you. When teaching percentages and fractions it is essential to find functional questions such as buying a car and paying a deposit and paying interest in order for learners to be familiar with the language used.

Question 5

Drawing a functional net of a cuboid proved challenging to most learners. While a small majority attempted this question, and a reasonable number of them used the correct scale, some used the incorrect scale where 1 square was 1cm. A significant number attempted a 3D drawing instead of a net or just drew one rectangle.

Centres should ensure learners practise scale drawings using squared paper with a variety of different sized squares, not just 1cm square paper. They need to ensure that learners know what a net is, possibly by opening out a variety of boxes into a flat shape so that the net is easily seen.

Question 6

Converting between currencies is a common and functional problem yet quite a few learners confuse the calculations and multiply when they should be dividing. While most were able to identify correct value from the table they did not show a valid check. Some learners also rounded the conversion given leading to inaccurate figures.

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 = 1.286 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.

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 1 or 2 marks. The most common error was doubling the IT support or only working out the room costs for 1 day instead of 2.

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.

Question 7b

Finding the area of a compound shape proved challenging to some learners and there is still a lot of confusion between perimeter and area. Many learners multiplied all the values together for the area, others found the perimeter instead. Some of those learners who found the correct area did not know what to do next or made an incorrect decision.

Centres need to give learners practice at finding area of compound shapes ensuring they know which values to use and what to do with them. Finding a missing length is essential and often involves simple subtraction. Again, centres need to stress the importance of reading the question very carefully and highlighting in some way all the relevant information, perhaps using it as a checklist.

Question 8

Drawing a simple pie chart proved challenging to most learners as well. Many left this blank, others just guessed and drew any angles. Even some of those who worked out the correct angles were unable to draw them correctly on the pie chart often not using the centre of the circle for the vertex of the angle.

Centres should enable learners to practise both drawing pie charts and extracting information from them. They also need to ensure learners can use a protractor with confidence.

Question 9

More learners attempted this question and were successful in finding the final figure and stating the decision. It was obvious that some learners did not understand ratio because the main error was adding the two parts of the ratio together and dividing the 178 by the answer (47). Again, the check was often ignored.

Centres need to teach all aspects of ratio and proportion not just dividing a quantity in a given ratio. They need to ensure that learners understand what a ratio actually means. Centres need to reinforce checking in every session so that it becomes an automatic process for learners to check their answers. There were just a few learners who checked all their answers whether a check was asked for.