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**Edexcel Functional Skills Qualification in
Mathematics at Level 2**

Principal Examiner Feedback

Sample assessment materials (SAMs)

First teaching September 2019

Edexcel, BTEC and LCCI qualifications

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Introduction

Learners have demonstrated an ability to apply many of the required skills from this specification but have often struggled to engage with the new content.

Centres are encouraged to ensure that learners have a secure working knowledge of the Level 1 skills to ensure that they are ready to learn how to apply the more advanced skills listed on the Level 2 specification, including working with multi-step problems that require a combination of skills and connections between content areas.

Working was often shown but was not always written in a sensible or cohesive way, with calculations seeming to be disorganised and often unclear. However, learners made good use of the answer boxes provided to clearly identify decisions or final figures. Learners should also be encouraged to write down all stages of their calculations even when a calculator is used. When calculators are used, learners should be reminded to retain accuracy by not rounding or truncating any figures resulting from intermediate steps.

Learners should be given plenty of opportunities to practice non-calculator methods to ensure that they have the best possible preparation for the non-calculator section. Some learners appeared to not have the correct equipment needed for the examination, particularly calculators for section B. The learners who appeared to have calculators, seemed to be unfamiliar with how to efficiently use functions beyond the four basic operators.

Report on Individual Questions.

Section A (Non – Calculator)

Question 1

The opening question which required learners to work with a three-part ratio problem was attempted very well, and it was pleasing to note that the majority of learners gained full marks. Some learners were awarded a mark for beginning to engage with ratio to find the amount of paint per part but were then unable to engage with the correct part of the ratio to find a solution or found the amount of each different colour of paint to make the total amount required but not identifying the amount of blue paint as their final answer. A small number of learners made the common error of dividing the total amount of paint needed by each part individually rather than the total number of parts, therefore gaining no credit.

Question 2

Estimating the mean is a new topic and the majority of learners were unable to engage well with this skill. Whilst a small number of learners gained partial marks for engaging with the frequency and the midpoints of the interval, they were often unable to complete the calculation due to dividing by the number of classes rather than the total frequency. Some learners wrote out the values contained within a class to help them identify the midpoint and this method appeared to work well. Learners who gained no credit often totalled the frequencies and divided by the number of classes. A large number of responses were blank. Centres should encourage learners to use the extra columns provided to help them with their calculations.

Question 3

This question required learners to use estimation, a skill that is new to the specification. The majority of learners were able to identify the type of calculation needed to make the comparison and gain partial marks, but most did not use a method of estimation and calculated the exact values and so only gained a maximum of 2 marks. Of the very few learners who rounded the figures before calculation, only a small number showed a formal method of multiplication and so often had arithmetic errors that effected the final comparable figures for the values chosen. It is sufficient to round to either one or two significant figures for questions involving estimation and learners should be encouraged to show a written method for calculations even though they have simplified the figures.

Question 4

The final question in the non-calculator section required learners to solve a multi-step problem involving volume, a metric to imperial capacity conversion and proportion. It was pleasing to see that the majority of learners engaged very well with the combination of skills involved, with many using suitable methods to find the correct solution with a correct decision. Learners who were not awarded full marks often forgot to make a decision or interpreted the figures incorrectly or did not have accurate comparable figures due to arithmetic errors. Partial marks were often awarded to learners who demonstrated the ability to work with volume and the conversion but were unable to work successfully with proportion. A small number of learners did not recognise that they needed to calculate with volume, with some working with area instead, but were able to convert their figures to litres and often then to gallons successfully.

Section B (Calculator)

Question 1

The first part of this question required learners to calculate and compare the median for an un-ordered set of positive and negative values with the median of another set of data. Responses were mixed with some showing a suitable method to find the median accurately and making a valid comparison. However, those not being awarded full marks showed either a correct method with some arithmetic error or did not make a valid comparison. Disappointingly, a larger than expected number of learners did not order the values before using a correct method to find the median value or calculated the mean instead of the median and so gained no marks. Learners should be reminded to check that the data presented is in numerical order before they attempt any further calculations. In part (b), learners were required to provide a check of their answer in part a. If a reverse method is chosen, the full process should be shown in order to provide a complete check, but the majority of learners only provided a partial check of their calculations.

Question 2

Part (a) was completed well in general, with many completing the sample space diagram, which is a new topic, correctly. Whilst parts (b) and (c) were often attempted, many learners provided answers that used incorrect probability notation such as ratio or used likelihood terminology instead of a probability.

Question 3

The majority of learners engaged well with this problem-solving question that required a fraction in its simplest form. Nearly all learners demonstrated the ability to work with at least one type of income correctly, with many being able to express an income from the gym as a fraction of an income from the office rather than a total income. Whilst many were able to fully simplify their incomplete fraction, only the more able gave a fully correct answer and many did not attempt to simplify at all. A method that appeared to work well was to write a fraction in words of what was needed e.g. gym as the numerator and total as the denominator before calculations were started and this acted as a reminder as to what was required.

Question 4

This question combined the use of a scale given in a ratio with interpretation of 3D shapes to draw an elevation. The majority of learners scored full marks, with many gaining partial marks for engaging with the scale to draw a pentagon with some side lengths drawn correctly to scale. More successful learners made use of the diagram to write down the number of squares needed on the grid after performing calculations to find the length of each side. This method appeared to work very well, with very few learners then making errors when drawing the final shape. A small number of learners attempted to draw a 3D representation. Learners should be reminded that plans, elevations and nets should be a 2D representation.

Question 5

A variety of methods were used to find a solution to this question involving a route with constraints and a conversion between miles and kilometres, with some being more successful than others. The most successful method was to find the total distance using a decimal equivalent for the fractional distances and do a conversion at the end. The least successful method was to convert the distances individually before totalling as this often led to inaccurate figures due to early rounding or truncation. Lost marks were often due to incorrect conversion from fraction to decimals or using an alternative conversion factor such as 1 mile = 1.6 km. Learners should be encouraged to learn how to calculate with fractions, particularly how to do this using a calculator. They should also be reminded to retain accuracy until towards the end of the calculations and to use the conversion factor provided.

Question 6

Surface area is a skill that is new to the specification and it was pleasing to see that some learners were able to engage with this question. The most common error was to work with volume rather than surface area, but of the learners gaining marks, some were awarded full marks and the majority gained at least 1 mark for finding the area of one face. A method that appeared to work well was to draw the net first and then work with area.

Question 7

Learners approached part (a) involving percentages very well, with a variety of approaches being seen. The most common approach was to calculate 18% and subtract from the original price to find comparable figures. A small number of learners also successfully used reverse percentages to find what the original price should be if the discounted price was correct. The most common cause of a lost mark was to not make a decision and learners should be reminded to read the question again carefully to check whether a decision is required. Part (b) was often not attempted correctly. A check using estimation was required but most learners used a reverse method or did not attempt this part of the question at all. Any sensible estimations involving rounded figures that would allow learners to check the reasonableness of their answer would have been sufficient and learner should be encouraged to use this method regularly when performing calculations in any content area.

Question 8

This multi-step problem combines different skills from all three content areas of the specification, as required by OFQUAL. Centres are advised to prepare learners for longer questions that require connections to be made. The majority of learners were successful with the Number and Handling Data elements of the question, with many demonstrating the ability to work with the average time taken to fill the old lorry and work with proportion to find a new loading time. Only the more able learners were able to engage with the Measure element and using a correct method to calculate the number of fridges that could fit in the floor space. Incorrectly dividing the area of the lorry floorspace by the area of the base of a fridge rather than considering the length dimensions was common and so the functionality of the question was lost.

Question 9

Working with the area and circumference of a circle is a new topic on the specification. Whilst some learners were able to calculate the circumference of the cake, many did not complete the calculations to fully solve the problem as they omitted the inclusion of the 6-inch overlap needed. A number of learners were not able to begin to engage with the problem due to not being able to recall the formula for the circumference or finding the area instead. Centres should encourage learners to memorise the formulae for both area and circumference as they may be required apply these when problem solving with circles or composite shapes containing parts of circles and when working with cylinders.

Question 10

This three-part question required learners to use and interpret a scatter graph in a variety of ways. The majority of learners were able to engage with the scale on each axis and plot the additional point in part (a). Drawing the line of best fit proved to be more challenging for most learners, with many assuming that the line needed to be drawn from the origin or only drawing a partial line. Part (c) was answered well, with many describing the relationship correctly or recognising that the correlation is positive. Either type of response is acceptable for the mark to be awarded.

Question 11

Success with this question linking area, unit conversion and fractional discounts was varied. Some were able to calculate the area of a triangle, but this was unfamiliar to a larger than expected number of learners. Some also lost the functionality by not working with a whole number of packs of tiles when beginning to work with costs. Calculating the discount by working with one third was often also carried out incorrectly, with the common misconception being that a third is equivalent to 33% or even 30%. When calculating with fractions of amounts, learners should be encouraged to divide an amount by the denominator rather than to use a decimal equivalent, particularly when working with thirds. The conversion was often not attempted or was carried out incorrectly after finding the area due to the common misconception of only dividing by 100 when converting cm^2 to m^2 . Learners should be encouraged to carry out conversions before performing any further calculations.

Question 12

Part (a) was generally completed very well, with many learners demonstrating an ability to work with the formula correctly and use the figures calculated correctly to find the deposit required. Some learners only engaged with the formula to gain partial marks and some arithmetic errors were also seen. A small number of learners did not attempt the question. Part (b) required an application of compound interest, a new skill on this specification. Many learners found this content to be unfamiliar and either worked with simple interest or did not attempt the question. Of the learners who engaged well, some worked with each year individually and others used the formula to find the solution with a single calculation. Both methods are acceptable and demonstrated equal success amongst these learners.

Pass mark for FS Level 2 Maths SAMs

Maximum mark	64
Pass mark	37

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