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Edexcel Functional Skills

**Qualification in Mathematics at
Level 2**

Principal Examiner Feedback

PMAT2 SET 3

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Introduction

This Level 2 paper assessed a wide range of skills in a variety of contexts and were generally tackled well by learners. The majority of learners attempted nearly all questions, with very few blank responses seen. However, questions involving skills new to the specification seemed to be the most challenging for learners on this third paper of the new specification. Further practise of using these skills would be beneficial and would help learners achieve a greater level of success.

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 to be made between content areas.

Working was often shown but was not always set out in a logical or cohesive way, particularly in the non-calculator section, with calculations seeming to be disorganised and often unclear. It was disappointing to note that a larger than expected number of learners appeared not to have access to a calculator for the second section, with many showing written methods, often with arithmetic errors.

For the majority of questions, learners made good use of the answer boxes provided to clearly identify decisions or final figures. However, a choice of methods was seen for a very small number of questions, with no use of the answer box to indicate which method the learner intended to use. Interpretation of results obtained is a requirement of the specification and so this, along with failing to make a decision at all, occasionally led to valuable marks being lost. Learners should be reminded to use the answer box to clearly identify their final answer for all questions and to cross out any work that they do not intend to use if a range of approaches are attempted.

Learners should also be encouraged to write down all stages of their calculations even when a calculator is used and to retain accuracy by not rounding or truncating any figures resulting from intermediate steps as this can lead to the final mark being lost.

Report on Individual Questions

Section A (Non – Calculator)

Question 1

The opening question on this section required learners to use proportionality skills in the context of a recipe. The first mark was awarded for beginning to work with fractional proportion which could be tackled in a variety of ways to find a suitable scale factor to work with. Whilst many fully correct responses were seen, partial marks were not often awarded, and this was mainly due to learners attempting to use a unitary build up method that only considered either 16 ounces of flour or 24 ounces of flour. Of those learners who recognised the need to work with fractional proportionality, arithmetic or rounding errors were often the cause of lost accuracy.

Question 2

Both parts of this underpinning knowledge question required learners to use formulae, with the one mark available in part (a) being awarded to the majority of learners. However, success when tackling part (b) varied considerably. The majority of learners knew how to substitute the given value into the formula correctly but were unable perform the correct operations. The most common error seen was to divide 16 by 5 and give an answer of 3.2 rather than find the square root of 16 before multiplying by 5. Developing knowledge of mathematical symbols and notation such as the square root should be practised further.

Question 3

Part (a) of this underpinning question required learners to find a fraction of an amount. Nearly all learners gained at least one mark for showing a correct process with an arithmetic error leading to lost accuracy, with the majority being awarded both marks for an accurate answer.

Learners were required to demonstrate an understanding of the relationship between ratio notation and fraction in part (b). Again, both of the marks available were commonly awarded for a correct simplified fraction. When full marks were not awarded, the first mark was commonly awarded for a partially correct fraction that was either not in its simplest form or contained an arithmetic error when finding the denominator.

Question 4

The first part of the final question in this section was a multi-step problem that required learners to work with percentages with a payment plan. Learners generally made good attempts to solve the problem, with many gaining at least 2 or 3 of the 5 marks available for calculating the total cost of the payment plan and then continuing to calculate 8% correctly. A range of approaches to find comparable figures was seen, with the most successful methods being to subtract 8% or to compare the percentage saving with the difference in cost. Making the correct decision based on figures calculated appeared to be challenging for the majority, with many making a wrong final decision. When marks were lost, it was often due to not showing a correct process when calculating with percentages, working with the payment plan incorrectly by adding the deposit to the monthly payment before multiplying by 12 months and arithmetic errors.

The mark for a check of the payment plan using estimation in part (b) was not commonly awarded. The majority of learners used reverse calculations as a check and so centres should remind learners to carefully read the question to ensure they perform the required type of check if one is specified.

Section B (Calculator)

Question 1

Part (a) of the opening question in this section required learners to describe the relationship shown on a scatter diagram and was answered well by the majority. Stating negative correlation or giving a description involving temperature and height was sufficient and when the mark was not awarded, it was often due to either just stating negative or only including one variable in the description.

Success with the interpretation of the scatter diagram in part (b) was varied, with many finding it challenging to read suitable values or calculate with negative numbers. Learners who drew a line of best fit or marked points to use were the most successful and centres should encourage learners to be confident in drawing or marking diagrams when interpretation is required. It was disappointing to note the large number of learners who made no attempt to use the scatter diagram to find temperatures to subtract and chose to subtract the heights given instead.

Question 2

This mini problem solving question required learners to use a suitable calculation to interpret a statement about the number of people per square kilometre in 2019 in part (a). Learners could use a range of approaches to find comparable figures with the most successful being to find either the actual number of people per square kilometre or finding the size of the population if the article was correct. The majority of learners were able to show a correct process to find comparable figures and interpret these to make a correct decision to gain both of the marks available. However, marks were often lost due to arithmetic errors, an incorrect or omitted decision or more commonly for showing a choice of methods and not indicating which method they used to reach the final decision.

The mark for a check using a reverse calculation in part (b) was awarded to nearly all learners which was pleasing to see. Occasionally the calculation shown was not evaluated correctly or at all and so the mark available was not awarded. Learners must evaluate correctly when performing checking calculations.

Question 3

It was pleasing to note that nearly all learners were able to gain at least 2 of the 4 marks available in this imperial to metric conversion problem solving question in the context of buying petrol, with the majority gaining full marks. A wide range of valid approaches were seen with the most successful route being to calculate the gallons needed for the distance to be travelled followed by converting between gallons and litres. When full marks were not awarded, it was often due to making a wrong decision or not changing the cost in pence to pounds to be able to show a full comparison.

Question 4

This question required learners to draw the front elevation of a playhouse using a scale given in ratio form. A mark was often awarded for using the scale correctly, with some gaining 2 of the 3 marks for a correctly shaped elevation with one dimension calculated incorrectly, but only the more able could combine this with understanding elevations to produce a fully correct response. Elevations are new to the specification, and it is disappointing to note that a larger than expected number of learners attempted to produce a 3D object rather than a 2D diagram.

Question 5

- (a) Estimating the mean from a grouped frequency table is a new skill that learners appear to find challenging. Whilst some fully correct responses were observed, a large number of learners are not able to demonstrate any understanding of the processes required to find an estimated mean. Commonly seen errors included adding the frequency and dividing by the number of groups and, of the learners that attempted to use midpoints, a division by 4 rather than the frequency was also a cause for marks not being awarded.
- (b) This part of the question required learners to use range to draw conclusions about the spread of marks in a test. Whilst some learners correctly identified that the range needed to be calculated, the majority of learners tried to compare the maximum values and then the minimum values rather than use range. At this level, learners are required to understand that range is a measure of consistency and allows for a comparison of spread.

Question 6

Learners could approach this question in a variety of ways, with the most common approach being to find 18% of the number of lollies sold in August and either subtracting to find the number that should be sold in September or adding it to the number sold in September to find what would need to be sold in August. Although this approach often lead towards learners gaining at least 2 marks, only the more able were able to interpret the figures obtained to make a correct decision. However, learners often only gained 1 mark using this approach due to finding 18% of both values given in the question and trying to compare the results. Another successful common approach was to calculate the lollies sold in September as a percentage of the lollies sold in August and subtracting from 100. Decisions made when using this method were correct more frequently. A small number of learners used a variety of methods, showing a wide range of calculations but did not always identify the final method they used to reach their decision.

Question 7

- (a) This part of the question required learners to use knowledge of directed number to complete a sample space diagram, with the majority gaining at least 1 of the 2 marks available and many successfully completing the table correctly.
- (b) Learners needed to demonstrate a combined knowledge of decimal and percentage equivalencies with the probability of combined events to give a valid reason as to why 0.5 and 5% were not correct in representing the probability of a negative score. Whilst many correct explanations were seen, this skill is an area requiring development for some learners.
- (c) The final part of the question required learners to use the table to find the probability of an event occurring, with the majority of response being correct. When learners were unsuccessful it was often due to not using probability notation and either using words or ratio to show the probability.

Question 8

This multi-step problem required learners to find the perimeter of a composite shape including a part of a circle and to work with a fraction to find comparable figures before making a decision. Whilst the majority were able to begin to calculate the perimeter and engage with the use of fractions to gain at least 2 of the 5 marks available, many did not use circle formulae at any stage. Of the learners attempting to use circle formulae, only the more able demonstrated an ability to correctly work with circumference and not the formula for finding the area. The use of circle formulae is a new skill in the reformed specification and learners still seem to be unfamiliar with the formulae they are required to learn and be able to use and so centres should focus on providing further practise opportunities for this part of the specification with learners.

Question 9

- (a) The majority of learners successfully demonstrated an ability to write down the coordinates of a point correctly to gain the mark available. However, a larger than expected number of learners wrote the values the wrong way round.
- (b) Two marks were available in this part of the question in which learners had to use knowledge of 2-D shapes to identify, plot and write down the coordinates of a missing point of a parallelogram. The majority of learners that correctly identified 1 of the 3 points gained both marks but some lost a mark due to transposing the x and y values or for either not writing down the coordinates or not plotting the point but stating the coordinates correctly. Learners should therefore be encouraged to read the question carefully to ensure they have completed all requirements of the question.

Question 10

The majority of learners found this inverse proportion question very challenging, with the majority attempting to use direct proportion and therefore gaining no marks. This skill is new to the Level 2 specification and centres should continue to provide learners with opportunities to develop the use of this skill. Of the learners that correctly identified that inverse proportion applied to the scenario, nearly all gained full marks, with a very small number only losing a mark due to an arithmetic error.

Question 11

This question draws upon all three content areas of Mathematics combined into a multi-step problem. In order to gain the marks available, learners needed to demonstrate an ability to apply the skills of calculating a Level 2 percentage, working with a bonus and calculating the median from a set of quantities presented in a frequency table to find the median amount Gavin earned per day. Whilst the majority of learners gained partial marks for beginning to work with the percentage and the bonus, only the more able learners could combine all three content areas with many working with the mean rather than the median or working with the median incorrectly due to excluding the day when zero cars were sold. As with other questions involving the use of percentages, marks were often lost due to not showing any valid processes. Another common error was misunderstanding that the bonus applied to each car sold rather than per day with many only including one bonus value in their calculations instead of using multiples based on the number of cars sold.

Multi-step problems combining different skills from all three content areas of the specification is required by OFQUAL and centres are advised to prepare learners for longer questions that require connections to be made.

Question 12

This final multi-stage problem required learners to demonstrate an ability to work with the area of a Level 2 composite shape, direct proportion and money to find the cost of the packs of the tiles needed to cover a floor. The majority of learners were often awarded at least 3 of the 6 marks available for finding a partial area and using the coverage stated to find the cost of the tiles for a partial area. The most successful approach when calculating the total area of the floor was to find the area of a whole rectangle and subtract the triangular part. Commonly seen errors were to forget to divide by 2 when calculating the area of a triangle, multiplying by the coverage rather than dividing or to not round up to a whole number of packs when finding the total cost.

Pass mark for FS Level 2 Maths set 2

Maximum mark	64
Pass mark	36