# Examiners' Report
# Principal Examiner Feedback

# Summer 2019

## Pearson Edexcel International GCSE
## Mathematics A (4MA1)
## Paper 2FR

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**Foundation Tier paper 2FR - Introduction**

Students who were well prepared for this paper were able to gain a good measure of success on the majority of questions. A feature of the new specification is problem solving questions. These tend to be more open-ended questions with less direction and prompts given at the outset. They frequently include the phrase 'explain your answer' or ask for some other justification of the answer. Students often lose marks here through either ignoring this aspect of the question or through the brevity of their answers. Q2(d), Q11 and Q14 were good examples of this style of problem solving questions. Many candidates here did necessary calculations but failed to reach a conclusion.

**Question 1**

All five components of this question scored well. The mark scheme was eased a little by allowing an answer of 5567 in place of New York for Q1(b).

**Question 2**

Most students were able to gain full marks on all 4 components of this question. In part (d) a numerical calculation was required to reach a total of 98 naan breads and a statement showing the manager was incorrect in his assertion.

**Question 3**

A variety of misspellings were condoned for Q3(a) Q3(b). In both parts the correct answer was the most common choice, though many thought the polygon was a hexagon.

**Question 4**

Both components of this question scored well, though a number of candidates thought Q4(a) contained some kind of trick and left the probability line blank.

**Question 5**

Many candidates failed to spot that there was only 1 answer for each of the 3 components to this question and hence lost marks by including a wrong answer with a correct answer. A typical example of this would be in Q5(iii) where candidates stated that 23 and 81 were prime numbers.

**Question 6**

A significant number of candidates produced an answer of 8.307808219 (from [9.24 x 4.35] ÷ 6.57 + 2.19). A safer way to gain full marks was to write down the numerator and denominator separately before attempting the final calculation.
In Q6(b) there was widespread confusion between rounding to 2 significant figures and 2 decimal places. Hence 4.59 was a very common answer. 4.60 also scored no marks. A follow

through mark was allowed from a wrong answer to Q6(a) if the latter was written down to at least 3 significant figures.

**Question 7**

The main common fault in Q7(a), (b) and (c) was writing the *x* and *y* co-ordinates in reverse order. Such occurrences were relatively rare and overall this was a well-answered question.

**Question 8**

Most candidates pick up all 3 marks here. The ones that didn't, often failed to round their answer to the first step (i.e. 1200 ÷ 45) down to the nearest integer (26) failing to recognise that you can't buy part of a pencil.

**Question 9**

This question caused unexpected problems with a significant number of students. Incorrect answers were usually the result of inadvertently thinking there were 100 mins in 1 hour when attempting to subtract the two times in the same day.

**Question 10**

Weaker candidates in Q10(a) thought angle BAD was $140^{o}$ thereby paying no attention to the appearance of the size of the angle in the diagram. Many candidates in Q10(b) failed to spot PQ or QR could be taken as a perpendicular height of a triangle and therefore missed the economical solution of 12 x 33. Attempts via Pythagoras led to zero marks being awarded.

**Question 11**

This was one of the more challenging questions on the paper, mainly because there were so many different start points. Candidates usually obtained the brick and crate volumes and then went on to examine the capacity of 5700 bricks with 4 crates. Their difficulty arose in coming to a logical conclusion of whether there was enough capacity in the 4 crates and justifying their statement. Typical good answers compared the capacity of 5700 bricks (769,000 $cm^3$) with the capacity of 4 crates (777,600 $cm^3$) or the number of bricks needed in 1 crate (1425) with the maximum number of bricks that could fit into 1 crate (1440).

**Question 12**

In Q12(a) a surprising number of candidates had trouble finding the mid-point of the 40 boxes of matches and opted to find the mid-point of 21, 22, 23, 24, 25 from the number of matches column. Others selected 8 from the middle of the second column. Q12(b), although requiring more computation, performed better, however many candidates opted to divide 902 by 5. Candidates should spend a little time examining if the size of their answer makes sense.

**Question 13**

In Q13(a) an answer of 5.3 instead of 5⅓ was not penalised, provided 16/3 was seen in the body of the script, otherwise only 1 mark was awarded. For answers without working, a minimum of 5.33 (2 digits after decimal point) was required to gain full marks.
Incorrect subsequent working from a correct answer was penalised in Q13(b) (e.g. $w^2 + 3w$ becoming $5w$ or $4w$ on the answer line). Q13(c) was not well answered. Many candidates were undone by the calculator giving an answer of – 25 (because $-3^2 = -9$). If substitutions are to be written down they should be precise i.e. $5 \times (-3)^2 + 20$ rather than (say) $5 - 3^2 + 20$.
A significant number of candidates had no idea what the term 'factorisation' meant and those that did have some idea often offered $x(x - 5) - 36$ as an answer.

**Question 14**

The question was similar to Q11 in that it had a variety of starting points, the most common being finding the ingredients needed for 1 blackcurrant pie. It was intended that candidates compared all 4 ingredients to find the greatest number of pies, and many did just this. The wording of the question inadvertently focused some candidates' minds on blackcurrants and hence by just considering this ingredient, they found the correct answer. As with Q11, this question provoked a mass of calculations, sometimes with no clear direction why, or where their reasoning was heading.

**Question 15**

Almost all candidates could work out that 8 litres of petrol were purchased in Q15(b). The scale on the litres axis caused some difficulty for some candidates, often choosing the point at 9 litres instead of 8. On questions where the graph is given candidates should be encouraged to show their reasoning by marking read lines on the graph.

**Question 16**

Gaining all 3 marks here was difficult for many. Some candidates were clearly ill-prepared through a lack of a protractor and unable to draw a bearing of 120°. Others had trouble converting the scale into kilometres or just ignored this and drew a line of 4.5 cm.

**Question 17**

In Q17(a) many responses were incorrect here. Most tried to incorporate the 5 on the number line above the head of the arrow into their answer so responses such as $-3 < x < 5$ were common.
Q17(b) was attempted better. The use (or lack of use) of the inequality sign was condoned until the last stage where the answer, offered on the answer line, was examined.

**Question 18**

This question required work done without a calculator. To gain full marks a clear method of a full path leading to $2\frac{11}{12}$ had to be explained at each stage. A variety of approaches were covered in the mark scheme, the most popular being converting to improper fractions at the first stage. Decimal conversions gained no credit.

**<u>Question 19</u>**

Many candidates failed to gain full marks because of an error in the first entry in the table. When $x$ = –1 many thought the corresponding $y$ value was – 3 (because the calculator told them that $-1^2 = -1$). Others lost 1 mark by including a horizontal line between (2, 7) and (3, 7). Graphs drawn as a series of straight line segments lost the accuracy mark in Q19(b).

**<u>Question 20</u>**

Whilst Q20(a) was answered well, Q20(b) had probably the lowest rate of success on the whole paper. 525 ÷ 100 was the most common incorrect response. Some candidates misread the question completely and tried to find the area of triangle ABC through area scale factors.

**<u>Question 21</u>**

Reaching P (mint) = 0.21 was achieved by a majority of candidates. Many went on to multiplying this value by 0.32 instead of adding. Overall, however, this question was a good source of marks.

**<u>Question 22</u>**

Again this question was a good source of marks for one so late in the paper. Many achieved the result of 30 matches won and 10 matches lost and subtracted these 2 values to reach the correct answer.

**<u>Question 23</u>**

Both parts of this question were poorly answered. Many candidates simply stated the value of A and B as whole numbers and tried to proceed from there. The point about common index numbers was overlooked by most.

**<u>Question 24</u>**

In both parts to this question many candidates did not understand what the term 'standard form' required, despite the prompt in Q24(a). Therefore, in Q24(b) many offered 750 000 000 as an answer and only gained 1 of the 2 marks on offer.

**<u>Question 25</u>**

At foundation level many did not use the economical method of $150{,}000 \times 0.82^3$ to reach the correct answer but broke the task down year by year. Some special case marks were awarded for confusing compound depreciation with simple depreciation.

**Question 26**

Candidates who obtained a gradient of – 2 (or + 2) gained the first mark but then often failed to obtain full marks because of errors in presenting their final answer. Examples of this included $L = -2x - 1$ or $-2x - 1$. Elsewhere weaker candidates failed to notice that the line sloped backwards and therefore should have a negative gradient as part of their final answer.

**Question 27**

Arguably this was the most demanding question on the paper and probably required the most amount of mathematical computation. Many candidates reached a first stage of calculating the length BD. In the second stage, whilst considering triangle ABD, many were confused as to which labels (adjacent, opposite etc.) to ascribe to this triangle. Having AB as the denominator added an extra complication. Remarkably some candidates used the sine rule directly on triangle ABC (i.e. AB/sin 32 = 3.1/sin 48) and one wonders why candidates this good were entered at foundation level.