# Principal Examiner Feedback

# November 2013

Pearson Edexcel GCSE
In Mathematics Linear (1MA0)
Foundation (Calculator) Paper 2F

**Edexcel and BTEC Qualifications**

Edexcel and BTEC qualifications are awarded by Pearson, the UK's largest awarding body. We provide a wide range of qualifications including academic, vocational, occupational and specific programmes for employers. For further information visit our qualifications websites at www.edexcel.com or www.btec.co.uk. Alternatively, you can get in touch with us using the details on our contact us page at www.edexcel.com/contactus.

**Pearson: helping people progress, everywhere**

Pearson aspires to be the world's leading learning company. Our aim is to help everyone progress in their lives through education. We believe in every kind of learning, for all kinds of people, wherever they are in the world. We've been involved in education for over 150 years, and by working across 70 countries, in 100 languages, we have built an international reputation for our commitment to high standards and raising achievement through innovation in education. Find out more about how we can help you and your students at: www.pearson.com/uk

# GCSE Mathematics 1MA0
# Principal Examiner Feedback – Foundation Paper 2

## Introduction

This paper was found to be reasonably straight forward at the start with a number of questions that caused some candidates problems towards the end of the paper. The paper produced a good range of marks for the award of grades. Errors were often made where the candidates did not read the question carefully.

Generally speaking, the standard of straightforward algebraic knowledge was not very good as candidates tended to use trial and improvement methods. Unless a trial and improvement method leads to a correct answer then no marks are awarded unless trial and improvement is the focus of the question. Candidates usually gained more marks for using an algebraic solution in those questions where an algebraic method could have been used rather than by using a trial and improvement method.

A significant number of marks were lost where candidates did not write down a statement of the result in the starred questions. Circling an answer is insufficient as we need to see a statement giving the required decision. A statement of how to work something out will also not gain any marks when a question ask for an explanation.

It is still surprising to see the number of candidates who did not have access to a calculator on this paper. Some repeated additions were seen for multiplication and when working out percentages without using a calculator.

Some students give more than one method and more than one answer. If they choose one of the answers to write on their answer line that is the method which will be awarded marks, but many do not do so.  This was often apparent in question 17.

Questions 1 – 8, 10 –  12, 14(a), 16(a), 22(a), 23(a & b)  were tackled with the most success. Whilst questions 9, 13, 14(c), 16(b), 19, 21, 24 – 28 were less successfully completed.

## Report on individual questions

## Question 1

A well understood question with almost all parts well answered. There were a small number of candidates that wrote 2019 as two thousand one hundred and 9 and gave the answer of tens instead of 70 for the value of the 7 in the number 4571.

**Question 2**

Almost all candidates could recognise the hexagon but there were many interesting incorrect answers to the decagon with the most common being tenagon and octagon. Only a third of candidates could name this correctly.

**Question 3**

This was a well answered question with almost all candidates being able to gain the marks in parts (a) and (b). Part (c) was answered well but some candidates were unable to subtract 77 from 102 but did gain one mark for showing an intention to subtract these two numbers though some lost both marks here as they were unable to choose the appropriate values from the table, selecting 88 instead of 77 was a common error.

**Question 4**

Candidates almost always recognised the angle as acute in part (a) though there was the occasional cute angle and the correct angle was usually measured although a significant minority gave the answer as 115° instead of 65°. For part (b) the correct answer of 53° was almost always given though we still continue to see explanations of how to work out the answer rather than writing angles on a straight line add to 180°. The reason here was often partially remembered and the word 'angles' was often missing, while some thought there were 160 or 360 degrees on a line.

**Question 5**

Almost all candidates understood that they had to find the difference between the two times of 17 50 and 19 30 but many candidates "forgot" that there are 60 minutes in an hour and subtracted two numbers on their calculator giving the answer of 180 which they often wrote as 1 hour 80 minutes or even 2 hours 20 minutes and so failed to gain any marks. The most successful candidates were those that counted on from 17 50 to 1800 then 1800 to 19 00 and then on to 19 30 and gained full marks for 100 minutes or 1 hour 40 minutes. Some candidates correctly recognised the answer was 1hour 40minutes, but used poor time notation, e.g. 1:40, 140, 1-40 etc. and did not gain the accuracy mark. In part (b)  many candidates did not read the question properly and based their answer on one £20 note instead of two, this usually earned them just one method mark for subtracting £8.50 from £20.

## Question 6

A well understood question with almost all candidates gaining the marks in part (a) though a small minority of candidates worked from right to left and added on 3 marks and did not score. In part (b) many candidates were able to give the correct answer but there were a few that only gained 1 mark as they went on too far with their number of terms or only recognised that one needed to add 5 to generate the next term. Again a few candidates worked from right to left and continued the sequence by subtracting 5 so did not score.

## Question 7

Part (a) was well answered by almost all candidates with part (b) being slightly less successful. In part (c) the success rate was also quite high though some candidates divided by 2 and multiplied by 3 and of course did not gain any marks. Some candidates attempted to convert ⅔ to a decimal or percentage, often using 60% or 75% and as a consequence earned no marks.

## Question 8

This question was well answered though relatively few candidates gained all 4 marks. This was usually because they omitted the frequency label on the vertical axis. Almost all candidates chose to draw a dual bar chart and the modal mark was 3 marks as they were able to draw the bars to the correct height and correctly label the bars and the horizontal axis. Very few candidates scored no marks in this question as marks could be earned for a key to distinguish between the two types of bikes and for labelling the days of the week, usually on the horizontal axis.

## Question 9

This question was not very well answered as many candidates did not remember the number of metres in a kilometre with 10 and often 100 being used as the number to multiply or to divide by being used. If the candidates showed their method then they could get a mark for showing they were adding their two lengths though many candidates did subtract instead. The most common wrong answer was 600 obtained by subtracting 650 from 1250 and this would have gained 1 mark if the 1250 metres had been seen and used.

## Question 10

A very well answered question though 5 was often seen as the input to get an output of 27 as though the candidate had correctly subtracted 7 they divided by 4 instead of multiplying by 4 as they needed to do for the correct inverse operation.

## Question 11

Almost all candidates were able to give the coordinates of the point *M* correctly and there were some good responses for marking the position of the third point of the isosceles triangle correctly. However, many candidates did not take heed of the information that *LM* was in fact the shortest side of the triangle so that the correct answer needed to be above 6.2 on the line $x = 5$ or at (2, 7) or (8, 7). Candidates that placed *M* below the 6.2 were given one mark if their triangle was isosceles.

## Question 12

As is usual many candidates mixed up the area and perimeter in this question. Almost all candidates were able to write down the number of lines of symmetry as 1 in part (a)  but in (b) the perimeter was often given as 28 (the numerical value of the area) or as 24 as the internal corners had been miscounted. Many candidates gave the correct answer of 144 but some then shot themselves in the foot by dividing (or multiplying) 144  by 2 as if they were finding the area of a triangle thus gaining no marks, whilst others gave the answer as 50 (the numerical value of the perimeter).

## Question 13

This question was only correctly answered by about half the candidates. There was confusion on two fronts, one was the different factors of 40 where candidates often gave two the same and the other was multiples of 9 where 3 was often seen as one of the three numbers.  Answers such as 24, 26, 28 failed to score through lack of working shown. Many also chose three numbers totalling 20 or 30, not recognising they were not included in the range.

## Question 14

Parts (a) and (b) were well answered with fewer than usual candidates selecting the incorrect average. There were a significant number of candidates that added the ten numbers and divided by ten but forgot to press the equals sign before the two operations. In part (c) most candidates gave an answer of 20 which was the total of all the frequencies but the correct answer of 55 was given by a pleasing number of candidates and those that showed that they understood that they had to multiply number of birds by their frequency gained a method mark if they did it for 4 readings.  Other incorrect answers often seen were 15 (the sum of the number of birds) and 35 (the combined total of frequencies and number of birds). A common error was to calculate $3 \times 0$ as 3 to reach a final answer of 58.

**Question 15**

In this starred question about a third of the candidates were correctly able to multiply 12, 4.5 and 5 and then divide by 8. Full marks were awarded for an answer of 33 or 34 but many candidates were able to score one mark for multiplying two of the three numbers or two marks for multiplying all three or multiplying two numbers and dividing by 8. Inevitably some candidates multiplied all four numbers whilst a small minority did not know how to start the problem.  Some candidates were still not aware you cannot have 33.75 boxes and some gave the wrong answer to $12 \times 4\frac{1}{2}$ through misuse of the fraction button on the calculator whilst some misunderstood $4\frac{1}{2}$ hours each day to mean four lots of half hours each day, i.e. 2 hours a day and some wrote $4\frac{1}{2}$ as 4.30.

**Question 16**

Almost all candidates were able to answer part (a) correctly but part (b) was not well understood. Some candidates were able to gain a mark for establishing 14 as a key number in solving the problem whilst others gained this mark for establishing a fraction equivalent to two sevenths with four fourteenths being the most common.

**Question 17**

As one might expect many candidates made the usual mistake of reflecting in the wrong axis but were awarded one mark, as were those that reflected in a line parallel to the *y* axis. Some candidates 'hedged their bets' and drew two or three triangles, and therefore gained no marks whilst others drew translations instead of reflections.

**Question 18**

Though most candidates understood how to use the conversion graph most candidates were not able to string together the correct argument to explain which car had the most petrol. Many candidates were also unable to read off the scale correctly on the gallon axis and this often led to the loss of a mark, candidates should be advised of the need for accuracy when taking readings. It was obvious when the graph had been used to obtain a conversion factor, but often no marks were apparent on the graph, sometimes losing the candidate marks. Some candidates used a conversion factor from memory without reference to the graph at all and units were at times confused or missing.

**Question 19**

Best buy questions are a common visitor to our papers and one would have thought by now these questions would be very well answered. Unfortunately this is not the case; whilst many candidates divided the cost of the tray by the number of plants in the tray they did not write the answer to a sufficient degree of accuracy to differentiate between the cost of one plant for each size of tray. This may be because candidates are 'drilled' into writing monetary values to 2 decimal places rather than looking at the size of their answers. When candidates divided the number of plants by the cost to find the number of plants per pound they often did not understand what they were calculating and stated it was the cost of one plant. However, about a quarter of the candidates were able to give the correct answer from correct working out of comparable results.

**Question 20**

This question was well understood with candidates' responses to part (a) being slightly more successful than those to part (b).

**Question 21**

The most successful responses to this question were those where the candidate had changed 1800 yards into inches and then into centimetres before then changing the centimetres into metes and dividing by the number of metres in a ball of wool. While a good number of candidates scored the first mark for multiplying 1800 by 36, only about a quarter of candidates could put this chain of reasoning together and come up with the correct answer. Many candidates again could not change between centimetres and metres whilst others came up with the correct answer of 7 by a wrong method and failed to score any marks. A common error was to begin by dividing 1800 by 36 rather than multiplying.

**Question 22**

This question should have been well answered by all candidates, particularly as most calculators these days allow for the calculation to be entered as it looks on the page. Part (a) was almost always correct but the modal answer to part (b) was to try and evaluate the answer to $\sqrt{(500 + 12.8)}$ rather than $\sqrt{500}$ then add 12.8. Whichever the result given it was possible to gain the mark in (b)(ii) for writing their answer correct to one decimal place even if it was the answer to part (a).

**Question 23**

In this algebra question there was a good range of marks with few candidates scoring zero marks. Parts (a) and (b) were the most successful but it was common to see 1 mark being gained for expanding the bracket in (c) and writing it as an equation though only a small number of candidates on this tier were able to go on and give the correct answer of 17 with 7 and 14.5 being a common wrong answer. Factorisation still remains a mystery to many foundation tier candidates with only about a quarter of the candidates giving the correct answer.

**Question 24**

The modal mark for this question was 2. This was usually obtained by those candidates that worked out $(360 - 4 \times 25) \div 4$ by using the central point of the diagram. Few candidates were able to then work with a rhombus to find the value of the obtuse angle marked *a*.

**Question 25**

This was a very well understood question with almost all candidates being able to obtain one mark either for finding out the cost of a computer from Logic or for finding 15% of £359. It was pleasing to see about a third of the candidates being able to work right through the problem and come up with the correct answer of £6.45 though many candidates lost marks either from not being able to work out 15% of 359 or for not taking a correctly worked percentage away from £359. Despite it being a calculator paper, some candidates found 15% by breaking it down into parts.  However, most do not show their method and if errors are made will not earn marks; many using this approach had problems with the decimal point.  Some candidates quoted 10% as 35 and 5% as £17.50 either because they chose an easier number to work with or had decided to 'round' £359',  Even those who found 15% to be £35.90 frequently failed to get a correct value for 5%, probably through premature rounding or truncation.  With no evidence that they were trying to halve their £35.90 this gained no marks.

**Question 26**

This question was not well understood and most candidates could not develop a strategy for tackling the problem. The most successful candidates realised that they needed to use a two way table and if they used one of these they usually gained at least 3 marks for this question. Those candidates who tried to deduce their answer from the information given usually restricted their number of marks to one or two usually for finding 34 men and 18 men studying Spanish.  It would have helped the candidates and the examiners had they written what their calculations represented, (e.g. $130 - 96 = 34$ men).

**Question 27**

About a half of the candidates used the wrong formula for the circumference of the circle with the area formula often being used. Full marks were awarded for those candidates that gave an answer in the range 439.6 to 440 but only one mark if they rounded to down to 439 on the answer line unless the correct answer was seen in the working space whereupon they could score both marks.

**Question 28**

This question was very poorly answered with very few candidates at all gaining full marks. A minority of candidates were able to make a start on the problem and gain one mark for calculating the distance travelled in one minute by dividing 30 by 26 but usually could go no further and some divided 30 by 70 but again could make no further progress. These were the most popular options. The most popular wrong answer was 2.3 from dividing 70 by 30 showing they did not understand the problem. Many candidates were confused by having three pieces of data and attempted to perform calculations with all three instead of using two to find a value they could compare with the third value. Incorrect units showed many were guessing.

**Grade Boundaries**

Grade boundaries for this, and all other papers, can be found on the website on this link:
http://www.edexcel.com/iwantto/Pages/grade-boundaries.aspx

Ofqual

Llywodraeth Cynulliad Cymru
Welsh Assembly Government

Rewarding Learning