Examiners' Report/
Principal Examiner Feedback

January 2014

Pearson Edexcel International GCSE
Mathematics A (4MA0) Paper 1F

Pearson Edexcel Certificate
Mathematics A (KMA0) Paper 1F

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

January 2014
Publications Code UG037768

Principal Examiner's Report KMA0 1F / 4MA0 1F
January 2014

This paper gave candidates the chance to demonstrate positive achievement. The majority of candidates were able to offer solutions to all questions but as the demand of the questions increased, it was not unexpected that the later questions (Question 14 onwards), were not as well answered as the earlier ones.

It was noticeable that in many questions where a calculator could have been used to find the answer, candidates either made arithmetic errors (suggesting that they had not made use of their calculator) or else attempted to get the answer by a trial and improvement method. Time, when used in calculation, continues to cause difficulties for candidates. This was evident in the number of incorrect responses to Question 14. Working with inequalities was also a significant weakness.

Question 1

In part (b) an answer of 'hundredths' rather than 'hundreds' was sometimes given. There were also occasional arithmetic errors seen in part (d).

Question 2

In part (d) those candidates who understood the term 'range' generally scored full marks. There were very few instances of the answer being left as 140 – 80 or 80 to 140. Some candidates did, however, find the median or, more commonly the mean, rather than the range.

Question 3

In part (a) the most common correct equivalent fraction given was $\frac{6}{10}$, although many other correct fractions were seen. In part (d), the most common error was in part (ii), with many candidates giving the *number* of boys instead of the fraction of the students who are boys.

Question 4

In parts (b)(i) and (b)(ii), it was pleasing to see many candidates correctly identifying the quadrilateral as a trapezium and correctly identifying the parallel lines in the diagram. Part (b)(iii) proved more difficult with many candidates attempting to find the perimeter rather than the area. Those who understood the concept of area sometimes attempted to apply the formula for the area of a trapezium, usually unsuccessfully, rather than count squares or divide the shape into triangles. In the two final parts of this question, candidates were generally far more successful in completing the shape with given lines of symmetry in part (c) than completing the shape so that it had rotational symmetry of order 4 in part (d).

Question 5

The correct pattern was seen in the majority of answers to part (a) although, very occasionally, there would be an incorrect number of dots on one of the ‘arms’ of the pattern. The table in (b) was invariably correct.

It was encouraging, especially at this Tier, to see a noticeable number of candidates who were able to generalise, both in algebra or more often in words. These generalisations included expressions such as ‘$2n + 1$’, ‘double the pattern number and add 1’ or ‘add the pattern number to the next pattern number’. Some were able to spot that there was always one more black dot than white in a given pattern but failed to explain how to find the number of white dots. Other explanations were often ingenious but almost invariably contained errors.

In part (e), the two most successful methods employed were either to carry on with the table (although this method did result in some errors) or to subtract one and then divide by two. Those who started off by halving 65 often faltered as they were then unsure as to whether they should add or subtract 0.5, and 32.5 was a common incorrect answer. Although most candidates gained either full marks or one mark in the final part of this question, many candidates were unable to make the leap into algebra and so failed to gain any marks at all.

Question 6

A surprising number of candidates were unable to use their calculator correctly in (c)(i) to work out the cube of 2.7. In part (c)(ii), attempts to round to three significant figures were frequently incorrect with a number of candidates giving the answer to 3 decimal places instead. A significant number of candidates who did give 3 significant figures forgot to apply the rounding rules thus giving 19.6 rather than 19.7

Question 7

$7c + 10d$; $3c + 10d$ and 3c +2d were all popular incorrect answers to part (a) with the latter examples picking up one mark for giving “$3c$”. Part (b) was extremely well done with the vast majority of candidates gaining full marks. There was a small but significant minority of candidates who correctly subtracted 5 from 17 but then also subtracted 4 instead of dividing by 4.

Question 8
It is pleasing to see that most candidates are using the correct notations for probability, however incorrect notation is still seen in a small number of cases. Candidates should be aware, when giving answers as a probability; fractions, decimals and percentages are the only acceptable forms. Also pleasing was the number of fully correct responses for all parts to this question.

Of the incorrect responses seen, the main misunderstanding for a significant number of candidates was that 5 different length of nail categories implied to them that probability answers should be out of 5, rather than derived from the total number of nails (20). Thus in parts (iii) and (iv), for example, answers of $\frac{2}{5}$ were extremely common, coming from the fact that 2 of the 5 categories needed to be included in the calculation for the correct answers.

Some candidates with less knowledge of probability chose to answer this question with word descriptions, for example, ‘certain’ or ‘unlikely’, which gained them no credit.

Question 9

Both parts of this question were well answered, but there were arithmetic errors evident in some solutions. Candidates would be well advised to write down all working to ensure that marks can be awarded for a correct method where appropriate. For example, in part (b) an incorrect answer of 106 or 126 without working scored no marks but the same answers with their full method shown usually scored one mark. In part (b), the most common error was to use the wrong number for the sum of the angles of a quadrilateral with 270 and 380 being the most common wrong numbers used.

Question 10

A good number of fully correct answers were seen, although this question proved challenging for others. The most common error following from a correct understanding of the question and a correct start (subtracting £4200 from £5772) was for dividing the resulting 1572 by 16 (pence) rather than by 0.16 (£), even though the value in the question was given as £0.16 The initial subtraction did, however, gain candidates the first method mark. A common error made after the correct subtraction was to then multiply 1572 by 16 or 0.16 which suggests that some candidates did not fully understand the implication of the question.

Despite the good number of correct responses seen, an equally common incorrect approach was division or multiplication of 5772 or 4200 by 16 or 0.16, with many candidates showing more than one of these and randomly selecting one resulting value for their answer.

Question 11

In part (a) the most common answer seen was the incorrect 20*c* with 9*c* also frequently seen. Only a minority of candidates appreciated that the variables simplified to give c^2 rather than *c*. In part (b) those candidates who understood the term 'factorise' generally scored full marks. However, many candidates attempted to simplify the given expression and frequently gave either 6*x* or $5x^2$ as an incorrect answer. In part (c), errors frequently occurred in both the substitution and the evaluation. Less able candidates commonly wrote down 52 rather than 5×2 when substituting y = 2 into the second term; 2^3 was often evaluated as 2 × 3 = 6. A small number of candidates stopped at 8 + 10 and therefore failed to gain full marks.

Question 12

In part (a) the majority of candidates were able to recognise enlargement and a good number the scale factor of 3. Far fewer knew that the co-ordinates for a centre of enlargement were also required for the award of full marks. Marks were awarded independently for each of these facts, so a good number of candidates scored at least one or two. However, many candidates ignored the demand in the question for a **single** transformation and combined their recognition of enlargement with, most usually, translation; they either stated it as such or described it in words as a horizontal and vertical movement. Thus they could not be credited with any marks. In part (b), translating a triangle posed very few problems and a very high number of correct solutions were seen.

Question 13

It was reasonably common to see candidates get parts (b) and (c) correct but part (a) wrong. 400 (from 750 – 350) was a common incorrect answer for part (a). In part (c) some used the value of 150 (ml) for 1 person from part (b) rather than 125 (g) for 1 person.

Question 14

Again it was encouraging to see responses with clear and succinct working, leading to a correct answer and the award of full marks. However, converting 10 hours 45 minutes into hours as 10.45 hours was a common error, seen more often than the correct conversion to 10.75. Using the value of 10.45 when multiplying by 852 (km) gained candidates the first method mark. Converting the length of time into minutes and then multiplying was also a popular approach but without subsequently dividing by 60, candidates could only score the first method mark could be scored. Understanding the relationship between distance, speed and time is a challenging one for a significant number of candidates at this Tier and division rather than multiplication was seen quite often. Given that this is a calculator paper, it was surprising how many candidates attempted their working by breaking the multiplication up into separate stages, often going on to make numerical errors; at very least, candidates might have used their calculator to check manual calculations.

Question 15

Some candidates displayed a secure understanding of using trigonometry to find the length of a side of a triangle and were rewarded with full marks. As ever, and despite the prompt in the question asking for 3 significant figures, there were those who gave an over-rounded value as their final answer; without showing sufficient (or any) working, which cost them marks. A fairly common error where candidates clearly had some knowledge of trigonometry was to select cosine rather than sine to find the length of the adjacent side, which denied them any marks, unless they progressed further. The occasional candidate chose tangent. A triangle with the length of a side marked prompted some candidates into trying to apply Pythagoras' theorem but the lack of a second given dimension meant that these attempts could go no further. Others focused on 43^0 and worked on incorporating 180 into their calculations.

Question 16

Success in part (a) was very varied with many candidates unable to make a start on a solution. In part (b) some candidates were able to show clear working, either in their table or in the body of the script, to calculate the correct total weight of the tea bags. Unfortunately some did not read the question carefully enough and went on to use this value to find the mean weight, which lost them the accuracy mark. Some were clearly helped by the guidance in the question, which provided two of the 6 midpoint values, although a common error was then to give the midpoint for $3.0 < w \leq 3.1$ as 3.5 rather than 3.05 – one such numerical error still allowed candidates to be awarded the method marks but they could not gain the accuracy mark. The most popular incorrect approach, seen more often than fully correct responses, was to add the 6 midpoint values and give this as the total weight. Some candidates did not understand that the midpoints given in the question were examples only, so added just these two values to give 5.8, while others made imaginative use of this value incorporated with other numbers to provide their final answer. There were a noticeable number of non-responses. For those candidates who showed 6 correct products, there was a surprising number who summed these incorrectly.

Question 17

In part (a), the question clearly stated that the answer was to be given as a single power of 2. Therefore, those candidates who gave the answer as 128 did not gain the mark. A common incorrect answer was 4^7. 4 was a common incorrect answer to part (b) from candidates who failed to interpret 2^n correctly and used $2n$ instead. Some candidates who did understand the notation then gave their final answer as "2^3" rather than "3" and so failed to gain the accuracy mark.

Question 18

A complete range of answers were seen in part (a) with lists of integers and numbers along with inequality signs, such as $1 < 4$, being common incorrect answers. Some candidates got the meaning of the open and closed circles the wrong way round. In part (b), while an encouraging number of candidates at this Tier were able to gain full marks for the correct inequality presented using the correct notation, there were also a significant number of non-responses. From the rest, many were able to benefit from the award of a method mark for a correct first step, usually $2y - 6 \geq 1$ written using inequality notation. The accuracy mark was often lost when a correctly derived solution was presented on the answer line as one specific value, ie $y = 3.5$ or simply 3.5 - where candidates wrote this solution without showing any working, no credit could be given.

Question 19

Success with this question was beyond most candidates at this Tier, as they failed to appreciate that the angle between the tangent and radius is 90°. However, fully correct solutions were seen, often including explanations which were not explicitly asked for. Many were able to gain one mark for identifying the alternate angle to the given angle as 58°, either using notation or more commonly by marking it onto the diagram. Two (wrong) assumptions then often followed: that the triangle was isosceles, most commonly with angle OTP also 58°, leading to a final answer of 64°; or that the circle was the focus of the question and involved angles adding up to 360^0. The notation for identifying angles is still not widely known by the candidates sitting this Tier, with a significant number thinking that angle OPT = 180°, being the sum of three individual angles O, P and T; thus final answers of 180° were not unusual.

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

Pearson Education Limited. Registered company number 872828
with its registered office at Edinburgh Gate, Harlow, Essex CM20 2JE