edexcel

Examiners' Report/
Principal Examiner Feedback

Summer 2015

Pearson Edexcel International GCSE
Mathematics A (4MA0)
Paper 4HR

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

Summer 2015
Publications Code UG042085

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

Introduction to paper 4HR

This paper was accessible to most students with the most able performing very well throughout. It enabled them to demonstrate their ability across the assessment criteria. On the whole, students seemed aware of the importance of showing appropriate method although there were still occasions when marks were lost for failing to do so.

Question 1

This was generally done very well, although occasionally parts (a) and (b) were the wrong way around, or both countries written out in full in part (b), or letters *i* and *a* left out of part (b).

Question 2

This question was answered well, with most students calculating 638/2.75 = 232. A small proportion of students converted the time to minutes and found 638/165 = 3.86666667, multiplying their answer by 60 to get 232. Others showed that they understood the relationship between speed, distance and time but left their answer as 3.86666667, or else did 638/2.45, both of which gained one mark.

Question 3

Students did well in part (a), the main error was multiplying by 1.75 instead of 1.075. In part (b) the most common errors were to leave their answer as 22500, forgetting to add back the 1800. Others evaluated 1800 × 1.08 or 1800 × 0.08.

Question 4

A good number of students were able to answer part (a) correctly, although some did not realise that the x and y scales were different so in effect plotted the line $y = 6x+2$. There was less success with part (b) with a significant proportion plotting the point P at (2,8). This gained no marks. Others succeeded in gaining one mark, mainly for plotting P to the right of $x=2$.

Question 5

In part (a), a number of students found the median number of certificates or the mean number of students rather than the median number of students. In part (b) a significant number of students did not understand what was required to find the interquartile range. Subtracting 7.5 from 22.5 was a common incorrect response.

Question 6

Part (a) was answered well by most students. In part (b), it was not unusual to see 0.44 multiplied by 0.42 and in part (c), some took AB to mean A and B and added group A to group B and then multiplied by 1200.

Question 7

Those students who had a basic understanding of bearings were able to find the bearing of *S* from *T*. Many, however, did not realise which angle had to be found, often, subtracting 43 from 360. Others found the angle between *ST* and the line due south of *T*.

Question 8

Most students were able to answer parts (a) and (b) correctly although in (a) some divided 175 by 16 before multiplying by 9. Part (c) was generally not so well done. The most common incorrect answer was 25:16 usually which came from comparing 175 (amount of fat given in part (a)) with 112 (amount of fat used in sweet pastry). Other students compared 7 with 14 and gave a final ratio of 1:2 or 2:1.

Question 9

Incorrect responses were rare in part (a). In part (b), many students gave the answer as $x < 3$ for which they gained one mark. This was because they failed to appreciate the need to change the inequality sign when dividing by a negative number. Part (c) was well done by most students with at least one mark usually being scored for a correct substitution. Part (d) was again well done with just a few students not realising they had to multiply 3 by $(f+2)$.

Question 10

This question was answered correctly by the majority of students. Most succeeded in stating that $\text{Cos } 56 = 7.4/x$ although a small minority made the error of $\text{Sin } 56 = 7.4/x$. The main loss of marks came from writing $x = 7.4 \times \text{Cos } 56$ instead of $7.4/\text{Cos } 56$. A less popular method was to find the opposite side and then use Pythagoras' Theorem. Whilst this was a suitable method, premature rounding often led to an inaccurate final answer.

Question 11

This was answered well by most students, although the minority who found the volume of the cylinder rather than the area, gained zero marks. A significant number found only the curved surface area or assumed the cylinder was open.

Question 12

This question was generally well answered. Some students gave the gradient as 3/5 rather than −3/5. Most students appreciated how the gradient and *y*-intercept relate to the equation of a line. A small number wrote $L = -3/5x + 3$ or just $-3/5x + 3$

Question 13

Parts (a) and (b) were well answered by most students, although some forgot to subtract 9 from 15 in part (b). In part (c), many failed to square the scale factor. Students found part (d) challenging. There were a number of possible correct starting points but the algebraic manipulation that followed often proved difficult.

Question 14

The majority of students had an awareness of proportion. Some, however, confused direct proportion with inverse proportion often starting with $V = kt^2$ or $V = k\sqrt{t}$. Others started with $V = k/t$. A small minority gave their final answer as $t^2=k/V$ which lost the final mark. Students who scored well in (a) invariably also performed well in part (b).

Question 15

Parts (a) and (b) were both answered well, although a few students plotted (2, 1) incorrectly or had a negative value of y for $x = 2$. Part (c) was more challenging with an answer of 5 occasionally seen, where the graph crosses the y axis. Part (d) was not answered well by the majority of students with most unable to make a start. Some used $y = 2x - 1$ instead of $y = 1 - 2x$.

Question 16

Very few students used p(at least one six) = 1 − P(no sixes) to attempt this question. The most common method was to try finding probabilities from a tree diagram and summing them. This approach was often only partially successful.

Question 17

Most students answered part (a) correctly. However, some incorrectly assumed that P was the centre of the circle. Consequently, these students deduced that MK was the diameter of the circle and that angle $MLK = 90$, leading to angle $JKL = 69°$. Part (c) proved even more challenging. Here, similar assumptions were made, often leading to zero marks being scored.

Question 18

A large proportion of students successfully drew four correct bars. Some of those who didn't manage this gained marks for finding correct frequency densities. In many cases, the bars that the students drew were correct in proportion to each other but not relative to the bar that was already drawn.

Question 19

Part (a) was generally well answered, with (a)(iii) producing the most errors. In part (b), a number of students failed to show that $245 = 49 \times 5$ and went straight to $7\sqrt{5}$, or failed to show the need to multiply by $\sqrt{5} / \sqrt{5}$. Students didn't always realise that 'show that' means all steps leading their answer should be shown. In part (c), most students attempted to expand the brackets but were unable to use the expansion to find e and f.

Question 20

A significant number of students were able to work this through to a fully correct solution. However, some students found the area, losing all marks. The use of the Cosine rule was the most common method used to find the length of side AC although the Sine rule and standard trigonometry were also used.

Question 21

In part (a), students who understood that the question required $y = x^2 - 16/x$ to be differentiated usually managed to successfully obtain $2x$ but many found dealing with $16/x$ a step too far**.** Even those who failed to score full marks in part (a) were able to score one mark in part (b) if they appreciated the gradient of the curve at point, *P*, was zero.

Summary

- It was clear from responses to question 7 that fewer than expected students had an understanding of bearings.
- Many students seemed unaware of the need to change the inequality sign when dividing both sides of an inequality by a negative number.
- Many students seemed to lack an understanding of area scale factors.
- For Circle theorem questions, for example, students should be encouraged to use the diagram to write down angles.
- For 'show that' questions, students should be aware of the need for detailed method.

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