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Unit M2: Methods in Mathematics (Algebra and Probability) - Higher

Report on the Examination

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Unit 2: Higher Tier

General

This was the first examination and the majority of candidates would have been in year 10. Despite this, there were some excellent scripts with many candidates being well prepared for the examination. There were also, however, many candidates with large gaps in their knowledge. This is likely to be centre based with the time constraints meaning that some topics just had not been taught. It is therefore not possible to be too specific about which topics were done well. However, some, such as Pythagoras' theorem and trigonometry, were done well and the intersecting chords theorem was not well done by the majority.

Question 1

This was well done. Errors included an answer of 496.8. Candidates are reminded that money answers must always be given to 2 decimal places, if appropriate. This was the QWC mark.

Question 2

The responses were varied. Some candidates clearly knew what to do, whereas others did not. Many filled in 6 in the outside of the circles which gained a mark in (a). Many who did not have a fully correct answer in (a) managed to identify the correct value from the Venn diagram in (b), for a follow through mark.

Question 3

This was fully correct about half the time. Few part marks were awarded. Candidates did not realise that the length was four times the width. A perimeter of $10x$ was common leading to an answer of 5.5 cm.

Question 4

Both parts were usually correct.

Question 5

This was well done. Arithmetic errors were the main cause of lost marks.

Question 6

Part (a) was usually correct. 1.5 was often identified as the answer in part (b) but without any justification. Solving $x = 5x - 6$ or drawing $y = x$ on the graphs were acceptable means of justifying the answer.

Question 7

Part (a) was quite well done. Common errors were to reflect shape A in $x = 1$, or to show the line $y = 1$ but reflect shape A in the x axis. Part (b) was not as well done. Combined transformations were often given. When a rotation was described, one piece of information was often missed off. A rotation needs a centre, direction and degree of rotation to be stated for full marks.

Question 8

This was well done. Most candidates scored full marks and, if not, part marks were gained for various kites that met the conditions of the question.

Question 9

Quite a few candidates scored full marks. It was necessary to draw the triangle C on the diagram (or at least one vertex). If this was correctly done then the scale factor and the centre were usually correct. Follow through was allowed for an incorrectly drawn triangle C. The scale factor was often correctly stated as 4, but the centre was rarely correct.

Question 10

Part (a) was usually correct. Part (b) suffered from poor rearrangement or poor arithmetic. $9y = 12$ was often solved as $y = 0.75$, for example. $5y = 12$ and $9y = –4$ were common first steps, and follow through was allowed on one error. Part (c) was quite well done by about half the candidates. Expansion errors, particularly with the minus sign, were common. The QWC mark was for a complete method, ie, writing the LHS as $7(w + 2) – 3(w – 4)$, putting their expansion = 21, then solving the resulting equation. Candidates could therefore score 3 on more than one error but could only score 4 for a follow through on one error.

Question 11

Part (a) was usually correct. There was less success with part (b), with 0.77, 0.770 and 0.7707 being common wrong answers.

Question 12

Part (a) was usually correct. Despite the obvious clue in that 4, 6, 10, 16, 24 was seen directly above 2, 3, 5, 8, 12 in the question for part (b), few candidates spotted this. Many attempted to work out a quadratic formula. The most common approach was simply to keep writing the sequence out. This was sometimes successful but often suffered from poor arithmetic or quoting the wrong term.

Question 13

Both parts were well done.

Question 14

Candidates who found the interior angles of both polygons usually scored full marks with the occasional arithmetic error. The most common error was to use the exterior angles as the interior angles. This would lead, for example, to angle *BXC* being 260°. Despite this value being greater that 180°, this did not prevent candidates from attempting to calculate angle *XCD*. Other errors were to take the nonagon as having 8 sides or to incorrectly state the total interior angles for either polygon. Many candidates showed angles on the diagram and this was accepted for a full method.

Question 15

This was fully correct about half the time. Errors were to give b as –5 or to try to factorise the quadratic.

Question 16

This was not answered well. Clearly the intersecting chords theorem had not been seen by the majority of candidates, or, if they had seen it, it was not understood. $9 + 16 = 25$, $25 \div 2 = 12.5$ was the answer given by the vast majority of candidates.

Question 17

This was quite well done. If candidates realised this was a sine rule question, they usually got full marks. Errors included rearranging the initial formula incorrectly.

Question 18

There were many fully correct answers. The most common error was to cancel the x^2 or, if some progress was made, to factorise $2x^2 – 7x – 15$ as $(2x – 3)(x + 5)$. This could still score 3 marks if appropriate cancelling was seen. A few candidates got the correct answer but went on to do some further, incorrect cancelling which lead to the loss of a mark.

Question 19

Correct answers were very rare. A mark was often gained for doing something with the initial ratio but few got beyond this. Trial and Improvement was often seen but it was rarely set out in a way that could be followed.

Question 20

Despite 'total' being in bold, the vast majority of candidates calculated the value of l for the curved surface area. Hence 14 was a common wrong answer.

Question 21

Part (a) was quite well done. Part (b) was less well done. Finding $\overrightarrow{PR}$ was an essential part of the process and this was often left as $\overrightarrow{PR}$ in formulae. Those candidates who made progress had some knowledge of vectors and knew to find $\overrightarrow{MN}$ or $\overrightarrow{ON}$ and compare this to $\overrightarrow{OM}$.

Mark Range and Award of Grades

Grade boundaries are available on the Results statistics page of the AQA Website.

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