OXFORD
INTERNATIONAL
AQA EXAMINATIONS

INTERNATIONAL GCSE MATHEMATICS EXTENSION

(9260/1E) Paper 1E
Report on the examination

June 2019

REPORT ON EXAMINATION: INTERNATIONAL GCSE MATHEMATICS EXTENSION 9260/1E PAPER 1E JUNE 2019

Students appeared to find most questions accessible and were able to demonstrate their mathematical ability at all levels. There was no evidence of time pressure, with the majority of students completing the paper. Many students gave well-constructed solutions, but some did not set out their solutions clearly and numbers were often written ambiguously. Premature rounding was frequently seen.

Topics that were well done included:

- ratio in the form 1 : n
- inequalities
- Pythagoras' theorem
- trigonometry
- factorising and solving a quadratic
- simplification of surds.

Topics which students found difficult included:

- types of correlation
- interpreting limits of accuracy
- using statistical measures to compare distributions
- rationalising a denominator
- circle theorem proof.

QUESTION 01

This question was quite well answered. The common wrong answer was 0.3×10^5.

QUESTION 02

This question was very well answered. The other three responses were equally popular among students who answered incorrectly.

QUESTION 03

This question was very well answered. The common wrong answer was 20.

QUESTION 04

This question was very well answered. The common wrong answer was $5.4\dot{2}$.

QUESTION 05

Part (a) was well answered. The common wrong answer was $p = 1$ and $q = 3$ or vice versa, with students not realising that 1 is not a prime number. In part (b), again some students used 1 as a prime number. Others thought $p = 2$ and $q = 3$ because 9 was prime or were attempting to find another square number.

QUESTION 06

In part (a), many students tried to describe the relationship rather than stating that it was positive correlation. In part (b), many students drew an appropriate line of best fit spanning all the points. Even those who drew a line that was out of tolerance usually read off accurately. However, it was less common to see students give the yearly rent, with many stating the monthly rent and not multiplying by 12.

QUESTION 07

This was very well answered. Most students were able to solve the inequality correctly in part (a). However, students were less familiar with representing the solution on a number line. Those who drew their closed dot and line above the given number line were able to show their answer unambiguously. Although a missing arrow was condoned for a full length line, the correct answer is more clearly expressed with an arrow. Part (b) was also very well answered. The common wrong answer was $-8 < 2y < 4$.

QUESTION 08

Part (a) was exceptionally well answered, with most students using Pythagoras' Theorem successfully. In part (b), some students worked out 10 × sin 52. Those who used the correct method sometimes truncated the value of sin 52 part of the way through and gave a final answer out of the accepted range.

QUESTION 09

This was very well answered, with the vast majority of students giving a fully correct solution. Occasionally, incorrect assumptions were seen. For example, some students assumed that the opposite angles in the quadrilateral summed to 180 degrees.

QUESTION 10

In part (a), some students gave the factorised version of the quadratic as their answer. Others gave both pairs of coordinates of the intersections with the x-axis rather than the x-coordinates. In part (b), some students gave the coordinates of the y-intercept. Many students knew the turning point was at $x = 5$ but were unable to work out the y-coordinate.

QUESTION 11

Most students answered this question well. Some did not evaluate their answer and gave it in index form. The common incorrect method was to work out the lowest common multiple.

QUESTION 12

This question differentiated well. Although many students knew how many faces a cube has, many gave the wrong number for a triangular prism. The most common error was to confuse it with a triangular-based pyramid and use 4 faces, but 3 was also commonly seen. The ratio part was done well, with only a minority of students dividing by 5 or 6 rather than the total of the faces.

QUESTION 13

Some students answered this AO2 question very well, with most of them giving sufficient working to verify what was required. However, some students used the areas of the shapes. Occasionally, premature rounding gave a slightly inaccurate answer.

QUESTION 14

Part (a) was well answered. The common wrong answer was 47 minutes. Part (b) was very poorly answered, with many students giving answers such as 48 or 48.5, 2 or 2.5 and 50.5 or 51. The most common correct answer was 48.4, 2.4 and 50.8.

QUESTION 15

This question was quite well answered. The other three responses were equally popular among students who answered incorrectly.

QUESTION 16

There were some very good solutions to this question, with some students forming an equation and others working out three possible values and using those. There were two common wrong methods; one was to form an equation with $0.4y$ instead of $0.6y$ and with $0.25y$ instead of $1.25y$. The other was to form and solve the equation $y - 0.4 + y + y + 0.25 = 39.33$.

QUESTION 17

Most students know that the branches needed to sum to 1 and/or that the probabilities of each outcome came from multiplying across. A fairly frequent error was to assume that one or both pairs of branches for the second coin were 0.7 and 0.3. Some students put the 0.2 and the 0.8 the wrong way round on the bottom branches for the second coin in an attempt to make the diagram symmetrical. Less able students added along the branches to work out the final probabilities.

QUESTION 18

The question had 11 pieces of data so that $\frac{n+1}{4}$ gave an integer position for the lower quartile in part (a). However, some students used Tukey's method of splitting the data into two halves that both include the median. Students that used this method performed less well, because it gave more complex working. Some students assumed that (a) was halfway between 10 and 14, so 12 was a common wrong answer. Parts (b) and (c) were poorly answered, with many students not aware that medians were the most appropriate measure for (b) and ranges or interquartile ranges for (c). In part (b), some students also compared the minimum and maximum values and the quartiles. Occasionally, students tried to use means, but it was not possible to calculate a mean for Aliyah. In part (c), some students gave the medians.

QUESTION 19

Some students did not use 90 – 20 for the distance travelled or 5 pm – 1 pm to work out the time taken. The common wrong answer was 18, coming from 90 ÷ 5.

QUESTION 20

Many students gave complete solutions to this question with concise, accurate algebra used. Some students were only able to work out the amount paid for the first 30 tickets. A good number of students were also able to state a correct expression for the total cost of passengers choosing a seat. Occasionally, students used an arithmetic approach that involved testing different numbers.

QUESTION 21

Both parts of this question were very well answered. Some students completed the square in (a) but were still able to solve the equation in (b). In part (b), some students found both solutions but then rejected one.

QUESTION 22

Although a few students did not recall the method to multiply out the matrices, many did this correctly. A common error was to omit the brackets around $b - a$. This was sometimes recovered, but often meant that the expansion was incorrect. Most students who formed the correct simultaneous equations went on to solve them accurately. Occasionally, students made sign errors leading to incorrect answers.

QUESTION 23

In this question, some students did not show sufficient working in either or both parts, which is vital when the answer can be obtained directly from a calculator. Part (a) was well answered, with students showing both surds in their simplified form. In part (b), all the terms from the expansion of the brackets needed to be shown in the numerator and denominator and many students did not do this. Occasionally, the fraction was multiplied in the numerator and the denominator by $5 - \sqrt{7}$ or $\sqrt{7}$.

QUESTION 24

Part (a) was very well answered. Students used the angle in the semicircle or the fact that *AOC* was isosceles with equal success. Occasionally, students thought that *OC* = *BC*. Part (b) was a proof question testing AO2 and many students did not show sufficient justification. Students needed to show their calculations and explain any value that was quoted. It is important that students know angle properties and quote the relevant theorems in this type of question. Part (b) was not attempted by a significant number of students.

QUESTION 25

In part (a), some students multiplied the two functions or worked out fg(x). Most students who were able to work out the correct expression for gf(x) went on to successfully solve the equation. A noticeable minority substituted $x = 1$ into the given functions. In part (b), many students started off correctly but then made an algebraic error when cross-multiplying. Some students gave the reciprocal of the original function. Students who were able to 'spot' the answer by swapping coefficients were unable to show any creditworthy partial working, so gained no marks if they made a slip.

QUESTION 26

Students generally either worked out the correct volume scale factor and gave the correct solution or used 10.24 as the scale factor. Some students tried to use the formula for the volume of a sphere.

QUESTION 27

The most popular method used in part (a) was finding the second differences, and the vast majority of students were successful. Students who went on to form equations sometimes started with $b + c = 81$, rather than $1 + b + c = 81$. In part (b), some students set up the correct inequality but were unable to solve it. Those who factorised and found the critical values of 25 and 30 were usually able to give a complete solution. Some students only worked with one solution so could go no further. Despite the instruction, a few students did use trial and improvement by substituting different values. Part (b) was not attempted by a significant number of students.

QUESTION 28

Most students started by expanding the brackets, occasionally with an error. Some went on to differentiate, but many substituted into the original equation. A few students worked out the gradient and then went on to work out the equation of the tangent, showing a lack of understanding of what the question had asked.

QUESTION 29

Not all students knew the correct formula for working out the area of a triangle without a right angle. However, many students did correctly work out the value of w. There were many errors in the formula used for the cosine rule. Some students dropped a perpendicular from *A* to *X* (on *CB* extended) and were able to use triangle *ABX* and then triangle *ABC*.

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