



AS

Further Mathematics

7366 Paper 1

Report on the examination

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Question 1

The vast majority of students identified the correct product.

Question 2

The vast majority of students correctly identified the second root.

Question 3

The majority of students correctly identified the asymptote equations. A small number selected the fourth option.

Question 4

The majority of students correctly identified the first two terms. A small number selected the first option.

Question 5

This question was reasonably well answered. Incorrect signs were the most common errors in both parts.

Question 6

This question was well answered with more than three-quarters of students calculating the correct values of z^2 and $\frac{z}{w}$.

In part (a), common errors included doubling the modulus or finding the square of $\arg(z)$. In part (b), the vast majority correctly calculated the modulus, but the argument was sometimes incorrectly given as $\frac{1.2}{0.4} = 3$

Question 7

Three quarters of students identified the error in part (a) and most explained the error clearly. Part (b) was reasonably well answered with most students making correct use of the power law to write the answer in the required form.

Question 8

Just over half of the students correctly proved the required result in part (a), moving from the left-hand side to the right-hand side via an appropriate use of equals signs. Some invalid responses made ambiguous use of arrows and implied signs. The reader was often left to complete the proof for themselves.

Part (b) was very well answered. Ambiguous or missing equals signs were usually condoned if the necessary algebraic expressions were given.

Part (c) was not well answered. Common errors included the substitution of $r = c$ instead of $r = c - 1$

Question 9

The vast majority of students obtained the critical values $\frac{2}{3}$ and 4, but only half could identify a correct region. A common error was to multiply the left-hand side by $(3x - 9)^2$, but then only multiply the right-hand side by $(3x - 9)$. A quarter of the students went on to obtain the correct solution. A common error was to include 3.

Question 10

Parts (a) and (b) were reasonably well answered. A common incorrect position vector of A' was

$$\begin{bmatrix} -2 \\ -5 \\ 4 \end{bmatrix}$$

Parts (c) and (d) were less well answered. In part (c), most students identified a correct direction vector, but many were unable to write the line as an equation. A common error was

to write $l = \dots$ instead of $\mathbf{r} = \dots$ or $\begin{bmatrix} x \\ y \\ z \end{bmatrix} = \dots$

The majority of students wrote down the first two coordinates correctly in part (d)(i), but only a third were able to identify the third coordinate, often using a long-winded method involving Pythagoras' theorem. Most students were unable to calculate the shortest distance or the triangle area, with a significant number making no attempt at these last two parts.

Question 11

Parts (a) and (b) were well answered. Common errors usually involved transposing two of the elements of a diagonal. Three quarters of students calculated the correct angle 30° or 750° in part (c), and most of these went on to correctly describe the transformation. Just over half of the students correctly calculated the value of n in part (d).

Question 12

The vast majority of students made some progress in this question. Most of these went on to solve their quadratic equation in e^x , with 60% of students calculating the correct value of x in the required form. Only a third of students provided a reason for rejecting the negative value of e^x .

Question 13

Most students wrote a correct expression for the required volume, with just over half simplifying it correctly. A common error was to increase the power of m when integrating. Most students made some progress in part (b). Just under half correctly calculated the value of m , with a significant minority using integration instead of the part (a) result. A common error was to multiply by 5 instead of 5^2 .

Question 14

Part (a)(i) was well answered. A common error was in not dividing by the determinant when calculating $\mathbf{B}^{-1}$. Just over half of the students correctly verified the required equivalence in (a)(ii). Part (b) was not well answered. Most correctly demonstrated that $(\mathbf{M}^{-1})^{k+1} = (\mathbf{M}^k)^{-1} \mathbf{M}^{-1}$ but didn't then use the hint provided in the question to complete the final step of the proof.

Question 15

Most students successfully wrote the equation of G_1 in the required Cartesian form. Part (b) was less well answered. Most could draw one of the graphs correctly, but only a quarter could draw both graphs and identify the intersection point. Common errors included drawing G_1 in the 1st and 2nd quadrants only and/or extending G_2 beyond the pole. Over half of students correctly found the polar coordinates of the intersection point in part (c). The final part was not well answered with only a third correctly calculating the required area.

Question 16

The vast majority of students scored marks in part (a) usually by completing the square or using the quadratic equation formula. The rest of question 16 was not well answered with a significant number of non-attempts. In part (b), many students incorrectly assumed the line between the two conjugate roots was a diameter of the circle. Part (c) was a challenging question with many students making little or no progress.

Mark Ranges and Award of Grades

Grade boundaries and cumulative percentage grades are available on the [Results Statistics](#) page of the AQA Website.