



Free-Standing Mathematics Qualification

**Using Algebra, Functions and
Graphs (6988)**

Intermediate Level

Report on the Examination

2008 examination - June series

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Using Algebra, Functions and Graphs (6988) Examination

General

The vast majority of candidates attempted all questions on the paper but with mixed success; high marks were achieved by some candidates while others found difficulty with even the easier questions. Some candidates seemed better prepared than others and these were able to interpret the information, manipulate algebraic expressions/equations and understand the demands of the paper.

Question 1

In part (a), nearly all candidates successfully plotted the data onto the distance/time graph.

The line of best fit was accurately drawn by most candidates in part (b).

In part (c), candidates attempted to find the gradient, taking suitable vertical and horizontal readings from their line of best fit but often overlooking the fact that the line's gradient was negative. Fewer than half the candidates used their gradient to obtain the formula for d in terms of t , using their knowledge of the general equation for a straight line.

Only the more able candidates realised that the solution to part (d) could be found by substituting $d = 0$ into their equation in part (c). Many candidates attempted to extend their line off the graph to find the number of days when the lava reached the village. A few made use of the gradient to find the answer but this often lacked the appropriate degree of accuracy.

In part (e), very few candidates appreciated the link between the gradient of the line and the speed of the lava and made a fresh attempt to calculate the speed. A common error was to simply take two values from the table and divide a distance value by the corresponding time.

Question 2

In part (a) candidates were often able to substitute the values of v and h into the given formula but then either did not know how to input these values into their calculator or failed to express a correct value into standard form.

The common error in part (b)(i) was for candidates to omit the brackets when multiplying u by $(h + 10.3)$. This resulted in their incorrectly making the first step of the algebraic manipulation, stating $uh + 10.3 = 10.3v$.

In parts (b)(ii) and (c) the majority of candidates found the manipulation of algebra linked with standard form values very difficult to come to terms with. Only the more able candidates achieved success in these parts.

Question 3

Part (a) was answered well by most candidates but many failed to state the correct units for the answer and stating cm^3 for the surface area was a common error.

Candidates had difficulty putting their thoughts onto paper in part (b). Some good explanations were seen which expressed the link between $2\pi x^2$ and the areas of the two circular ends of the cylinder, but the link between the curved surface area and $2\pi xy$ proved more demanding. Many candidates explained that from the formulae given on the data sheet, $r = x$ and $h = y$ could be substituted, resulting in the required conclusion.

Some partial factorisation was seen in part (c) but it was disappointing to see that so many candidates did not understand what was meant by the term 'factorise' and gave expressions which bore little resemblance to the expression given in the question.

In part (d) most candidates gave the correct term for the area of the circular base and many of these went on to successfully complete the expression for the total surface area in terms of π , x and y .

Very few candidates linked the answers in parts (c) and (d) to the answer in part (e). Lengthy numerical calculations were often made to find the ratio of the two surface areas.

Question 4

It was pleasing to see many candidates correctly calculating the values for n and k in parts (a) and (b) respectively.

In part (c), approximately one third of the candidates selected the correct graph to show the relationship between n and x , possibly indicating that a degree of guesswork was used!

Question 5

The correct distance between the two bus stops was found by many candidates in part (a). The vertical scale was sometimes read incorrectly with the vertical height being given as 17 metres per second rather than 16 metres per second. The link between area under the graph and distance travelled was appreciated by most candidates.

In part (b), the common mistake was to calculate half the distance found in part (a) and to divide this by the maximum velocity; candidates failed to realise that all of this distance was not covered at the same speed. Very few candidates realised that it was necessary to first find the distance travelled at the maximum velocity by calculating $360 - \frac{1}{2}(20 \times 16)$ before dividing this answer by 16. Those who obtained an answer of 12.5 seconds did not always remember to add the time taken to travel the first 160 metres (20 seconds) to obtain the total time.

Question 6

Many correct expressions for the length and width of the shaded section were stated in part (a). A few candidates gave the terms as $20 - x^2$ and $8 - x^2$, rather than $20 - 2x$ and $8 - 2x$.

In part (b)(i) the product of the values found in part (a) were often equated to the area 124cm^2 but the area of the small white square was overlooked. This resulted in the quadratic equation containing the value $4x^2$ rather than $3x^2$.

Candidates who wrote the correct opening equation sometimes found difficulty correctly multiplying the two brackets together.

In (b)(ii) most candidates attempted to solve the quadratic equation using the general formula method. Unfortunately many gave the value of $-b$ as -56 rather than 56 which resulted in two negative answers for x . Only a very small number of candidates used factorisation to calculate the values of x .

In part (b)(iii), some candidates who had the correct answers in part (b)(ii) failed to realise that the answer 18 was not appropriate in this question. Candidates who successfully found the values of x in part (b)(ii) often failed to attempt part (b)(iii).

Turn over ►

Portfolio FSMQ Intermediate Level – June 2008

Many centres submitted portfolios that demonstrated independent work and were developed from a wide range of other subject areas studied by candidates. However, centres must ensure that they follow the Specification carefully otherwise candidates will not produce complete portfolios.

Candidates entering portfolios for **Calculating Finance** made use of some excellent Internet research to provide them with different savings accounts and a wide range of methods of borrowing. It must be remembered, however, that long term loans (e.g. mortgages and student loans) must be investigated as well as short term loans. The production of accounts involves two sheets with a 'carry forward' from the first sheet to the second.

Some exciting investigations were produced for **Handling and Interpreting Data** with original sources of data from several subject areas. Most candidates did investigate the effect of using at least two different groupings as part of their data and some interesting comparative pie charts were also produced. However, some candidates did not demonstrate enough techniques at Intermediate level to achieve a mark of 35 or more.

Several centres produced **Using Algebra, Functions and Graphs** portfolios. These were generally of a good standard but again the Specification must be studied carefully. There are five elements that must be completed for this portfolio. There was evidence of good use of algebraic formulae and good algebraic manipulation.

Mark Ranges and Award of Grades

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