



Free-Standing Mathematics Qualification

Using Algebra, Functions and Graphs 6988

Intermediate Level

Report on the Examination

2007 examination - June series

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General

Most candidates attempted all the questions and there was a wide range in their ability with some producing a perfect set of answers but the majority failing to gain fifty percent of the marks. Some candidates did not have the necessary equipment and were unable to complete parts of questions. A calculator and a ruler are essential for this examination. The question on simultaneous equations, some of the basic algebra and the interpretation and use of the line of best fit were generally answered well.

Question 1

In parts (a) and (b), the points were plotted accurately and a suitable line of best fit was drawn by nearly all the candidates. Most candidates made a good attempt to use their graphs to calculate the gradients of their lines in part (c) and the method used was usually clearly shown. The most common error was to misread the scale; with quite a few candidates counting squares rather than using the vertical and horizontal scales. In part (d), some candidates used the graph rather than using the formula from the previous part to estimate the walking distance. There were very few correct explanations in part (e), with the most common incorrect reason being that the line was too short or that values greater than 6 would not fit on the graph.

Question 2

In part (a), many candidates attempted the correct division but failed to obtain the correct index in their standard form answer. A common error was to subtract the values. There were many correct calculations in part (b), but, as in the previous part, some final answers had the correct figures but the incorrect place value. Some candidates reversed the mass of Earth and the mass of Mercury in their calculation. Part (c) saw some good attempts at a difficult calculation, with the most common error being the failure to cube the radius. This was probably because the radius was equal to 2.45×10^3 so a value cubed was already present. The use of the diameter rather than the radius was another common mistake. Marks were often lost for not giving the final answer to 2 decimal places and for failing to state the units for the volume. In the final part of this question, some candidates who made the correct calculation and obtained 38.7% then concluded by stating that the student in the question was correct. A variety of methods were attempted and those students who calculated 37.8% of 1.5×10^8 showing the answer was not equal to Mercury's distance from the Sun were usually successful.

Question 3

Most candidates successfully wrote down the correct pair of simultaneous equations in part (a). Candidates who used 'g' and 'd' rather than 'x' and 'y' were not penalised if they used these letters consistently.

In part (b), nearly all candidates attempted to multiply the first equation by 2 to make the coefficients of y the same but some forgot to multiply 580 by 2. However, candidates who used this method were usually successful in calculating the cost of a gate. A small number of candidates tried to express y in terms of x and then substitute this value into the other equation but none of these reached a correct solution.

Question 4

Correct tangents were usually drawn in part (a)(i) and the correct method was generally used to find the gradient in (a)(ii). Errors usually occurred when candidates misread one of the scales; usually the vertical one. A small number of candidates attempted to calculate the gradient without any tangent being drawn. In part (a)(iii), only a small proportion of the candidates correctly stated the units for deceleration. In part (b), there were different methods used to find the area under the graph. Those candidates who understood how to use the trapezium rule were usually successful.

Question 5

This question was challenging for the majority of candidates. In part (a), only the more able candidates were able to successfully rearrange the formula. Some made one correct step, usually multiplying by 2, but got no further. In part (b), some candidates used their answer from part (a) to try to find the value of x , while others reverted to the initial formula for the volume of the greenhouse. All parts of (c) were poorly attempted. In the first part, the common error was to leave out the brackets around the $(2n + 4)$ which resulted in an incorrect product of the terms. In the second part, most candidates were unable to equate $15n^2 + 30n$ with 125. In part (c)(iii), the formula was understood by most candidates with the correct values of a , b , and c being substituted. However $-4ac = -4 \times 3 \times -25$ was incorrectly calculated as -300 rather than $+300$. This resulted in the square root of a negative value being attempted. In the last part, very few candidates seemed to realise the need to use the values of x and y in the first part of (c) and often rewrote the answer from part (iii).

Question 6

In part (a), some candidates correctly calculated 250×2.95^0 as 250 but many incorrectly calculated 250×2.95 . In part (b)(i), the correct answer was obtained by some candidates but many who showed $250 \times 2.95^{-0.6}$ failed to evaluate this correctly. Some correct explanations were given in part (b)(ii), showing that the candidates understood that the population was this size two days before observations began. There were some correct answers in part (c) but it was generally poorly attempted.

Principal Moderators Report

FSMQ Intermediate Level

The majority of centres submitted entries for Calculating Finances and Handling and Interpreting Data, with only a small number of centres submitting work for Using Algebra, Functions and Graphs.

Calculating Finances Portfolios

Although several centres submitted very pleasing portfolios, there were centres who had not appreciated the depth of work necessary at this level. Tax investigations were generally well done. The requirement to produce "two reports that illustrate how repayments that you make will vary if you borrow money a) over a short period and b) over a long period" was generally less well met. Candidates should be encouraged to consider credit cards, loans, mortgages and, say, student loans to satisfy all the requirements for this element.

Savings investigations generally gave scope for independent work and were well executed. Again, the accounts investigation was not always carried out according to the specification, which indicates that sheets from two or more periods should be included, with the carrying forward of information from one to the other.

Handling and Interpreting Data Portfolios

Some excellent portfolios were submitted, with critical reports being well written in many cases and very relevant to candidates' interests. Again, some centres did not appreciate the standard of work required for this level. The Teachers' Guide indicates that for more than a bare pass at Intermediate level the portfolio should include some of those topics listed in the Intermediate specification which are not within the Foundation unit. Such topics include cumulative frequency diagrams, histograms with uneven intervals, weighted means and comparative pie charts. For a portfolio to be worthy of a mark of over 35, a significant proportion of the portfolio

must demonstrate such techniques. Candidates should also be encouraged to use probability measures to explain the likelihood of an event.

Using Algebra, Functions and Graphs Portfolios

The few centres who submitted portfolios produced work of a high standard. The administration was generally satisfactory with centres supplying samples in a timely manner.

Mark Ranges and Award of Grades

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