LEVEL 3 CERTIFICATE
MATHEMATICAL STUDIES

1350/2C: Graphical Techniques
Report on the Examination

1350
June 2019

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General

There was a significant increase in entries from last year, with nearly twice as many students sitting the paper.

There was a slight increase in the mean mark scored. The most notable improvement was in the higher-difficulty marks. The number of students achieving a mark of 40 or more out of 60 was double that of last year. This indicates an encouraging increase in the number of students who are coming into this exam very well-prepared.

All parts of the paper were answered reasonably well, and nearly all question parts were attempted by the vast majority of students. The only question parts which were not attempted by a significant number were 6(b) parts (iii), (iv) and (v).

Question 1

Most students gained full marks in part (a).

In part (b), again most scored both marks. A few students incorrectly stated that there should be gaps between all the bars, which is not the case for a dual bar chart such as this.

Nearly half of all students got part (c) completely correct, with most of the remainder scoring one or two marks. There were a number of equally correct approaches to this problem, all of which were given full credit. A few students failed to gain marks by using an average of the amounts of fat in prawn cocktail crisps instead of taking the value of 10.8 from the table on page two.

Question 2

Nearly all students gained some marks in part (a), but relatively few gained all three marks. Students who identified errors but did not suggest improvements were not following the instruction in the question, and therefore could not gain full marks.

In part (b), quite a few students noticed that the research assistant needed to multiply the result by 100, but then failed to spot that she should have divided by a different denominator. Students should be reminded that in a three-mark question such as this there is likely to be more than one correction required.

Part (c)(i) was generally done well, but some students did not use the correct figures of 493 and 478 (or numbers close to these) to work from. In part (c)(ii), some students did not use percentage or proportional changes, but simply considered the differences of the values. This approach did not gain any marks.

Question 3

Nearly all students gained both marks in part (a).

Part (b) was mostly done well, but a few students plotted points inaccurately. A few students failed to gain a mark by joining the points with straight lines rather than a curve.

About one third of students correctly drew a tangent at the relevant point and were then able to gain marks in part (c). Nearly all of the rest incorrectly chose to calculate an average speed.

Many students, having effectively answered part (c) with what would have been a correct answer to part (d), may then have been distracted by this from answering part (d) correctly.

Question 4

Approximately two thirds of students correctly read off the value of 4 from the graph to answer part (a). A few overcomplicated things and incorrectly arrived at answers close to, but not equal to, 4.

The majority answered part (b) correctly. Most of the remainder gave the answer as either 2.5 or 4.

About a third of students scored full marks in part (c), with another third gaining one or two marks.

Question 5

Many students did not see that Emma's journey had to start at 500 on the vertical axis, and started their graph at zero. Of those who did start at 500, most completed a fully correct graph.

Many students recovered to answer part (b) correctly, with nearly half gaining full marks.

Question 6

Most students appreciated the need in part (a) to convert the speed to metres per second, but some only divided by 60 once, or multiplied by 100 instead of 1000.

The majority answered part (b)(i) correctly. It was not sufficient to answer 'the speed decreases' or similar.

Nearly all students set up one or more equations in part (b)(ii), but relatively few were able to gain more than one mark. This suggests that the solution of simultaneous equations may be an area of study that would benefit from closer attention in the future.

Very few students answered part (b)(iii) correctly, with many just making a general statement about the meaning of a negative gradient.

Around half of all students made a reasonable attempt at part (b)(iv). Those who saw that A must be negative and that the optimal flow would occur at k = 87.5 were able to score two or three marks.

Part (b)(v) required students to refer to information from more than one earlier question part. This proved challenging, with only a minority of students scoring both marks.

Question 7

Nearly all students correctly identified the positive gradient in part (a), and many gave a correct reason. Some incorrectly stated that because the values of $f(n)$ were positive the gradient had to be positive.

Substituting the correct values into the equation of $f(n)$ proved tricky for most students in part (b). Most who did this then went on to score more marks, with some correctly taking logs to reach the correct answer.

Mark Ranges and Award of Grades

Grade boundaries and cumulative percentage grades are available on the Results Statistics page of the AQA Website.