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Examiners' Report
Principal Examiner Feedback

Summer 2022

Pearson Edexcel Awards
In Algebra Level 2 (AAL20)
Paper 01

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Edexcel Award in Algebra (AAL20)

Principal Examiner Feedback – Level 2

General Comments

All questions on this paper were accessible and provided students with the chance to show the relevant skills required by the specification.

Many displayed good skills but some found working with fractions difficult, transposition and dividing the biggest number by the smallest number were misconceptions seen often.

The ability to draw and sketch graphs was better this year but many still struggle with the use of negative x coordinates..

Reports on Individual Questions

Question 1

Part (a) about 80% of students gave the correct answer, unfortunately an incorrect answer seen was $2d$ presumably because there were 2 d's in the question.

Part (b) was well answered, most students gave at least one term correct and many answers were fully correct.

Part (c) was very well answered and only a few incorrect answers were seen.

Part (d) was again well answered, not quite as many correct answers as part c but still over 80% of the cohort got this question correct.

Part (e) was the most difficult part of this opening question but the modal score was 2. Of those that did not score both marks many did score one mark for a partially correct answer.

Question 2

Most students were able to match the graph with the equation and the modal score was 3 marks. Of those that did score full marks most scored 2 marks with usually 3 correct identifications seen.

Question 3

Part (a) was well answered with $3m$ seen as a popular incorrect answer.

In part (b) many correct answers were seen. But few students who did not score full marks scored the part mark. There were only a few students who did not attempt to factorise fully.

Question 4

Part (a) was a well answered question with very few incorrect answers seen. When an incorrect answer was seen the student appeared to display very poor algebraic knowledge.

Part (b) was also very well answered. Some students did try to guess the numerical solutions on this question and this method was not that successful. Students are expected to be able to manipulate algebra accurately on this specification.

Part (c) Again a very well answered question with 70% of the cohort giving the correct answer. When a correct answer was not seen most students were able to show a first step eg multiplying out the bracket but then did not go on to rearrange correctly, the calculation with a negative number did prove too difficult for some.

Question 5

Part (a) most students scored full marks. A few students were not able to give all three values but most of these students did pick up the method mark for showing the ability to multiply by 3 to find at least one extra term.

In part (b) over half the cohort scored full marks. Some incorrect answers used $11n$ or $2n$. Of the students who did not score full marks most did not score at all. Writing the n th term for a sequence is something centres should practice more with students.

Question 6

Part (a) was very well answered with over 90% of the answers given being fully correct. Of the few incorrect answers seen it was usually the second term that was incorrect.

Part (b) was also very well answered with then a 80 % of the cohort scoring full marks. Again errors seen were mostly in the second term and the power was often incorrect.

Question 7

Almost every student scored at least 1 mark on this question with many students able to correctly identify the expression and the second formula and often one of the others. The modal score for this question was two marks.

Question 8

Part (a) was again well answered but for those that did not obtain the mark this was usually due to incorrectly reading the scale eg stating 155 or 180.

Part (b) was not so well answered with many realising they had to use 75 and 1.5 hours or 90 minutes but only some students could use these figures to calculate accurately. Many students just wrote $75 \div 90$ and stopped there.

Some successful students read from the graph that using a gradient/triangle method and could see that you travelled 50 km in one hour and so this is the speed. Another method that eased the calculation required was to see that you travelled 25 km in 30 minutes and so the speed was 25×2 , these methods when seen were successful.

In part(c) the scale was sometimes an issue but the majority of students did give an answer within the required range.

Completing the graph in part (d) was better answered than part (c) and many correct answers were seen. Of the few incorrect answers seen the line drawn was correctly placed but too long or a few students did try to continue the graph in the bottom right hand corner. Careful reading of the questions is recommended.

Question 9

The first step to draw this straight line graph was often seen as multiplying out the bracket. Some students could not do this and actually worked with $y = 2x + 1$. They were then able to draw this line and did gain a mark for drawing a line of the correct gradient.

Some students set up tables and worked out the points to plot by substitution (with or without multiplying out the bracket) once a table was seen the points could be accurately plotted.

Once points were plotted most students did join the points with a straight line.

Another approach seen was to state the gradient as 2 and the intercept as 2 but then stop. Few students knew what to do with this information to produce a correct answer.

It was disappointing to see some students thought this graph was a parabola or a line with negative gradient – very little reasoning was given to these answers but the lines appeared to be a ‘guess’. By far the best method to use was to set up a table and plot points.

Question 10

Part (a) was well answered with most students able to give a correct answer. The most popular incorrect answer was -2

In Part (b) a variety of answers were seen with students using incorrect equality signs or given inequalities that are impossible eg $-3 > y < 2$,

students should check it is possible to find a number that satisfies the inequality they give.

In part (c) fully correct answers were given by just over half the cohort but many scored only 1 mark usually for a filled circle at zero. The common incorrect answer seen was to draw a line in the positive direction along the number line.

Part (d) was not so well answered, many students could isolate the terms in w to obtain

$2w < 3$ but then went on to write $w < 2/3$ or even stopped at $w + w < 3$. Full processing is required for the accuracy mark.

Question 11

The question was received a variety of answers and about half of the sketches seen gained full marks. Where marks were lost this was usually due to no clear label on the y intercept at -3 or to draw a curve that was clearly not symmetrical about the y axis.

Centres are advised to practice sketching curves and students should not rely on setting up tables and plotting.

Question 12

Students found this question challenging with the difficulty increasing through the question reflected in the marks given.

Part (a) was well answered although some students gave the answer of $x + 3$ rather than $3x$.

In part (b) students lost a mark by failing to add all three terms together often missing out the ' x ' term. Some of the students that had the three terms correct: x ; $3x$ and $x + 5$ were unable to sum these correctly, often with a squared term appearing.

Part (c) was the part that more students found difficult, far too many students showed no working whilst others missed using brackets or some had $3x - (x + 5)$ but missed simplified and hence gave the incorrect answer of $2x + 5$.

Centres should remind students of the care that needs to be taken when using brackets in algebraic expressions.

Question 13

Overall this question was well answered.

In part (a) the vast majority of students gave the correct answer.

Reading the correct year from the graph proved a little more difficult than part (a) with some students reading the scale incorrectly.

In part (c) the main problem was again some students' inability to read the scale correctly. However, surprisingly, those who did read the scale correctly obtaining the values of 7.8 and 11.2 could not always subtract them accurately and hence did not gain the accuracy mark.

A few students in part (d) lost the mark by giving a single year rather than a range as was required. Students should always read the question carefully and be sure to answer the question asked.

Question 14

The success rate for this question declined through the parts.

The vast majority of students scored full marks for part (a). Of those that did not most were able to substitute $v = 10$ correctly and gain the first mark.

In part (b) over 70 % of the students gained all 3 marks. A few students substituted v as 5 instead of d and so gained no marks. Whilst others, correctly substituted d as 5 but then had problems manipulating the equation, with many deciding to multiply by the 2 but forgetting to multiply every term by 2 and getting $10 = 3v - 1$.

Part (c) proved more difficult for students as no numbers were to be substituted in. Students had the same problems manipulating the algebra and often forgot to multiply every term by 2, hence obtaining the popular incorrect answer of $(2d + 1)/3 = v$

Centres are encouraged to practice algebraic manipulation involving fractions and negative numbers.

Question 15

This question was generally well answered with any students able to gain full marks.

The most common error seen was to obtain the value for y as -3 when $x = -1$. This was then usually plotted correctly and student could score one mark in part a and b. Even with this error students could go on to score both marks in part (c) and many did so.

However in general part (c) was challenging for students and a popular wrong answer was to read off values of x for where the curve crossed the x -axis. A few students tried to read off at $y=2$ but did not use the scale on the x -axis correctly and so only scored one mark.

Students would benefit from using a variety of scales in graph work.

Question 16

The modal score for this question was 3 marks. However many students only gained the first method mark for multiplying by the 5 to remove the denominator, obtaining the correct equation $12x + 3 = 10x$. It was evident that many students were then unable to collect terms to one side and fully solve the equation. Some students did get to the point $2x + 3 = 0$ but then when on to give the incorrect answer of $x = 1.5$

Question 17

Far too many students just ignored the scale on the graph and worked in squares thus arriving at the incorrect gradient.

As follow through was allowed in part (b) this was more successfully answered than part (a).

Students were often able to use their answer to part (a) and the intercept to give a correct follow through answer.

Of those that did not score two marks many did score one for either the correct term in x or the correct value of c written in an equation of the correct format.

A common error seen was to miss out the x in their attempt to write the equation of the straight line.

Summary

Based on their performance on this paper, students are offered the following advice:

- ensure you can carry out basic arithmetic accurately, particularly when dealing with negative numbers and 0
- work more with negative numbers and fractions in algebraic manipulation
- sketch graphs when asked to and do not rely on plotting values
- remember to use the scale correctly on given graphs.

