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Examiners' Report/
Principal Examiner Feedback

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Pearson Edexcel International GCSE
in Mathematics (4MB0)
Paper 01R

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Grade Boundaries

Grade boundaries for this, and all other papers, can be found on the website on this link:
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In general, this paper was well answered by the overwhelming majority of candidates. Some parts of questions did prove to be quite challenging to a few candidates and centres would be well advised to focus some time on these areas when preparing candidates for a future examination.

In particular, to enhance performance, centres should focus their candidate's attention on the following topics, ensuring that they read examination questions VERY carefully.

- Reasons in geometric problems
- Compound probabilities (without replacement)
- Literal questions: inequalities
- Literal questions: simultaneous equations
- Defining regions by inequalities
- Median value
- Conversion between units

In general, candidates should be encouraged to identify the number of marks available for each part of a question and allocate a proportionate amount of time to each part of the question.

It should be pointed out that the methods identified within this report and on the mark scheme may not be the only legitimate methods for correctly solving the questions. Alternative methods, whilst not explicitly identified, earn the equivalent marks. Some candidates use methods which are beyond the scope of the syllabus and, where used correctly, the corresponding marks are given.

Details of Marking Scheme and Examples of, and Report on, Candidates' Responses

Question 1

The vast majority of candidates had no problems in correctly solving this linear equation.

Question 2

Whilst 70% of candidates correctly arrived at the required gradient, a significant minority (approximately $1/6^{th}$ of candidates) showed method but then spoilt their good work with incorrect arithmetic.

Question 3

About 10% of candidates did not seem to know what is an irrational number. Of the remainder, the majority identified both the correct answers.

Question 4

Another well-answered question with nearly 90% of candidates achieving full marks.

Question 5

All but a very few candidates scored full marks on this question.

Question 6

Candidates who sit this paper invariably have good algebraic skills and responses to this question were excellent with 90% of candidates scoring full marks.

Question 7

This was the first question on the paper which proved to be a challenge to a significant number of candidates. Whilst about a third of candidates knew what to do and scored full marks, many of the remainder did not seem to understand the three conditions given for the sets *A*, *B* and *C*. A common error was drawing *A* such that *A* was **not** a subset of *B*.

Question 8

Some candidates were confused because both kilometres and metres were mentioned in the question. As a consequence, on some scripts, *h* was converted to kilometres before a calculation was carried out. On other erroneous scripts the candidate simply forgot to find the square root. As a result, only just over half the candidates scored full marks on this question.

Question 9

The vast majority of candidates scored well on this question with many showing a clear understanding of standard form and significant figures.

Question 10

Two thirds of candidates clearly knew how to express 270 m as a percentage of 30 km by converting one of the given values to the same units as the other. Incorrect conversions proved to be the downfall of those candidates who failed to score full marks.

Question 11

The overwhelming majority of candidates correctly substituted $x = -2$ into the cubic expression to find the required value of *k*. Some candidates attempted (successfully) to divide the given expression by $(x+2)$ to give a quotient of $4x^2 + k$. In this instance the value of k came from the solution of $-18 - 2k = 0$ where $-18 - 2k$ was the remainder.

Question 12

This question proved to be quite a discriminator with candidates' performances being spread across the mark range. About a third of candidates did not seem to know where to begin and left the question blank. Of the remainder, many either got the inequality signs wrong or failed on the last part where $32x + 25y \leq 3.00$ proved to be a popular, but erroneous, answer.

Question 13

About two thirds of candidates scored full marks on this algebraic simplification question. Of the few errors seen, many either simply lost the factor of 2 in the numerator or were unable to see a common factor in both the numerator and the denominator. Factorising a quadratic did not prove problematic at all.

Question 14

Approximately one third of candidates either did not know how to start this question or simply used an incorrect equation. Indeed, of those who did get full marks, more seemed to favour using the equation $\frac{180(n-2)}{n}=150$ than determining the external angle of the polygon as 30^{o} .

Question 15

This question proved to be quite a discriminator with a significant number of candidates (25%) scoring no marks at all. This was invariably as a result of simply writing down the equations (rather than the required inequalities. Of the 50% of the remainder who did not score full marks, most either got one or more inequality signs around the wrong way or seemed to be confused between x and y giving $x \geq 0$ rather than the required $y \geq 0$.

Question 16

This question did not cause many problems for candidates with part (a) answered correctly by 95% of candidates and the vast majority of candidates (over 80%) were able to simplify $\frac{x-y}{x+y}$ to $\frac{5-4}{4+5}$ to arrive at the required answer of $\frac{1}{9}$.

Question 17

Expressing 4^{x-3} as 2^{2x-6} was the first step for successful candidates to arrive at the required solution. However, approximately one quarter of candidates were unable to do this and invariably either left the question blank or filled the working area with erroneous working.

Question 18

The overwhelming majority of candidates correctly evaluated the required angle. However, of these candidates, only a third were able to give a suitable reason. The clue to an acceptable reason was in the stem of the question: *ABCD is a cyclic quadrilateral…* Many candidates seemed to be content to either give no reasoning at all or gave the usual *angle sum of triangle* as a reason. The result was just over 55% of candidates scored 2 marks (out of 3) on this question.

Question 19

Part (a) proved to be problematic to some candidates as they simply took the average of the middle two numbers in the sequence $\left(\frac{3+13}{2}=8\right)$ rather than putting the 7 integers into order first. As a consequence, the correct answer of 14 proved to be less popular than expected. In part (b), candidates were able to recover by using their answer to part (a), but the understanding of *x is three times the median* proved to be difficult for a significant number of candidates with many simply using the correct method for finding a mean but adding $"14"$ or $2\times"14"$ onto the numerator. As a consequence, both marks were lost here. Just under 50% of candidates scored full marks on this question.

Question 20

This question did not prove to be problematic to those candidates who recognised that they needed to work with $(\text{numbers})^3$. As a consequence, about two thirds of candidates scored full marks. Of the remaining candidates, many seemed to have simply misread the stem of the question and used $(\text{numbers})^2$ instead.

Question 21

About two thirds of candidates scored full marks on this question. Of those candidates who did not score full marks either showed no method or simply made arithmetical slips in multiplying out their bracketed terms.

Question 22

This question proved to be quite problematic to the majority of candidates. Many simply did not correctly convert either 45 km to cm or 66 cm to km, but the major cause of problems here was not realising that they needed to work with the **diameter** of the wheel rather than the radius. As a consequence, answers of the form

1.08×10^n proved to be popular but erroneous. Just over 25% of candidates scored full marks on this question.

Question 23

About three quarters of candidates correctly solved the given inequalities but only two thirds of these candidates went on to answer the question. Many simply left their answer in the form $\frac{10}{3}\le x\le\frac{22}{3}$ scoring only two out of a possible four marks.

Question 24

Approximately half of the candidates either did not begin this question or stopped after identifying an angle that could then be used to help in the solution ($\angle BCA = 60^\circ$ or $\angle DCA' = 40^\circ$ or $\angle DCB' = 20^\circ$). Such candidates scored, at most, one mark. Many of these candidates seemed to be distracted by evaluating the length of *AB*, rather than focussing on the length of $A'C$ = 7 cm. Of those that did progress, the vast majority were able to determine the correct area.

Question 25

Candidates who take this paper are usually strong in algebra but curiously here nearly 20% either left this question blank or made an incorrect first step. Of the remaining candidates, a quarter either stopped after the first step ($x + xt^2 = 1 - t^2$ or $x\left(1+t^2\right) = 1 - t^2$) or simply went wrong with their next step and consequently gained no further marks. Just under 40% of candidates scored full marks on this question.

Question 26

Fundamentally a simultaneous equation question which proved to be problematic to some candidates who did not recognise that the sum of the four internal angles of a quadrilateral always total 360°. As a consequence, at most two marks could be earned by these candidates. Some 60% of candidates did however score full marks on this question.

Question 27

Responses to this question were quite variable with either no attempt made (25% of candidates), no progress after part (a) (25% of candidates) or completely correct (30% of candidates). Working with three dimensional figures is not an easy topic and candidates would be advised to break each part of the question into a two dimensional diagram. So, in part (a), the drawing of triangle *EBA* and placing on this diagram the lengths of *EB* and *AB*, may have helped some candidates who otherwise would not have started. Similarly, the drawing of triangle *EBD* in the first instance would have helped in the finding of *BD*. This length found could then have been used in triangle *BAD*.

Question 28

50% of candidates got this question completely correct whilst about a third of candidates scored no more than the first mark. Clearly, there is still much work to be done, by some centres, on the topic of compound probabilities without replacement.

Question 29

A quarter of candidates did not seem to know where to start on this question, but for the remainder good progress was made as over 55% of candidates scored five or more marks Indeed, **all** those candidates who correctly identified that *AD* = 10 cm in part (a), used the the intersecting chords theorem correctly in part (b) and wrote down the length of *AB* correctly in part (c). Part (d) proved to be a little more elusive for about 40% of candidates as they seemed unable to link the values found in the first three parts of the question to find *AD* (and then *AO*).

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