Examiners' Report
Principal Examiner Feedback

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Pearson Edexcel International GCSE
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Principal Examiner's report

Students who were well prepared for this paper were able to make a good attempt at all questions. It was encouraging to see many clearly showing their working. Students were less successful in using conversion graphs, scale drawings and surface area of a prism.

Overall, working was shown and was easy to follow through. There were some instances where students failed to read the question properly. For example, in Q20, most students did not manipulate the ratios correctly.

A striking weakness in students was solving problems with areas, finding LCM, applying trigonometry and Pythagoras' theorem. On the whole, problem-solving questions and questions assessing mathematical reasoning were not tackled well, this was particularly apparent in questions 5, 9, 10c, 13, 16, 24 and 25

Question 1

(a) This part was answered well. Many students gave an answer of 15

(b) This part was answered well. Many students gave an answer of 18

(c) This part was answered well. Some students mixed up a square number with 8

(d) This part was answered well. Many students gave an answer of 2, however, some students assumed that 15 was a prime number.

(e) This part was answered well. Many students gave an answer of 8 and 18

Question 2

(i) Some students found this part of the question challenging. A common incorrect answer was 'likely'.

(ii) and (iii) These two parts were well answered by most students.

Question 3

(a) This part of the question was very challenging for most students. Common incorrect answers included pentagon, hexagon etc

Part (b) was well answered for (i) and (ii). Some students confused edges with vertices giving the answer as 15

(c) Many students did not read the question carefully. Students could not work out the number of edges of the pyramid. Many students thought that the number of edges of the pyramid was 5 by simply counting the emboldened number of lines. Students were writing 70 – (5 × 5) giving an answer of 45 which gained no marks.

Question 4

(a) This part was answered well. Many students gave an answer of $9y$

(b) This part of the question was poorly answered. A common incorrect answer was $12p$

(c) and (d) These parts were answered well.

(e) Collecting like terms was well done, although the directed number aspect is still an issue for some. The most commonly seen error was simplifying to $10c - 2d$ or $10c + 8d$ or $8cd$.

Question 5

Many students were able to score at least two and often three marks in this question. A mixture of approaches and answers were seen for this question. Students who subtracted £6.90 from £15 and then went onto divide by £0.55 gained two marks. Some students at this stage gave answers as 14. 72… or 15 losing the final mark. Some students tried repeated addition or occasionally repeated subtraction, but far too many basic errors in arithmetic were seen. Even when the arithmetic was correct students then miscounted and gave an incorrect answer or they gave a monetary value. Some failed to stop at £15 and chose to spend £15.15 instead.

Students need to ensure they read all questions carefully.

Question 6

(a) This part was answered well; however, some students did not write 1 as a factor thus losing the mark.

(b) The first mark was gained when the students only had to show one of the numbers written as prime factors, which could be at the end of factor trees or on 'ladder' diagrams, or 2 multiples for each number or use of the table method. Most managed to do this for one mark, and a significant number achieved full marks. Some students used factor trees or 'ladder' diagrams and then tried to draw a Venn diagram which they tried to use and lost the final mark. Generally, this question was answered poorly as many students could not gain the second mark as they had no understanding of the meaning of LCM's.

Some students confused HCF and LCM. They often do not know what a factor or a multiple is. The majority of students gained one from the factor tree. The most common mistake as an answer for was 6 or 12.

Question 7

(a) The most successful strategy seen was to write all the numbers out to 3 decimal places and then compare. A common incorrect answer was to place 0.54 before 0.504 or misplace 0.5

(b) Majority of the students gave the answer as 80%. Some students gave the answer as 8%

(c) Writing $\frac{31}{9}$ as a mixed number was straightforward for many, but commonly seen was a decimal answer.

(d) Many students gained one mark from converting $\frac{7}{25}$ to 0.28. A common incorrect method was to write 0.88 – 0.28 and then divide by 2 to give an answer of 0.3.

Question 8

Part (a) of this two-way tables question was answered very well with most able to pick up 3 marks for 6 correct entries. Very few workings out were shown; for those who did not gain full marks almost all picked up 1 or 2 for a partially correct table. In part (b) success was more varied with some unable to give a correct fraction.

Question 9

Many students worked out the required angle was 32°, however, many students could not give the correct reasons to gain the final mark. Many managed to use the fact that angles in a quadrilateral sum to 360 and then found angle *ABD* which was 106° thus gaining one mark. Not all students who correctly calculated angle *ABD* were able to complete this question correctly, deciding to go off in all sorts of related incorrect calculations. Some of the weaker students knew that angles on a straight line totalled 180° but chose to use angle *EAB* with angle *ABD* to find angle *DBC*. Some students did not realise that triangle *DBC* was isosceles and could not work out the size of angle *x*.

Students are encouraged to write down the reasons for each stage of working as stated in the question.

Question 10

(a) and (b) Many students secured two marks for providing accurate conversions using the graph. However, others drew lines on the graph, not always correctly, but failed to take any accurate readings from these.

(c) Many students found this part of the question quite difficult. Students were confused whether to convert 950 Danish krone to dollars or 170 dollars to Danish krone. Some students chose to take their initial reading near the origin which by the time they had multiplied it up to 1020 Danish krone or 158 dollars was too inaccurate to give an answer within the range allowed. There was some misunderstanding of the scale on the Danish krone axis, with some students assuming 1 small square = 1 Danish krone.

Question 11

(a) The majority of students answered this part of the question correctly, but a written method was rarely seen. Of those who didn't score full marks, many scored the method mark for calculating the numerator or denominator correctly. Indeed, those students who worked out the numerator and denominator separately would usually go on to gain full marks.

(b) This part of the question was poorly attempted. Common incorrect answers were 0.935 or 0.94 or 935

Question 12

This question was a good discriminator with part (a) being well done by most students and part (b) providing more of a challenge. Most of the students were successful in gaining both marks in part (a) and only a minority of students gained all 3 marks in part (b). In the second part some students failed to realise that the question was testing inverse operations and substituted 55 for the length of the journey or for the number of bus stops. Other students were able to identify the inverse operations needed but applied them in the wrong order. Many students used a trial and improvement method. Sometimes students could have avoided a loss of marks by checking that they had put the correct number on the answer line. For example, "55 = 2.5 × L + 1.5 × 1.8" was often seen in the working space but sometimes the answer "17" was then written on the answer line. Students should show all the intermediate steps. In these cases, students were using trial and improvement to find the answer of 17.2

Question 13

Students who realised that that the dimensions given were not in the same units. They had to convert metres into centimetres or vice versa. Students who converted the dimensions into either centimetres or metres were more successful in gaining marks in this question. Two main approaches to this question were seen; either the calculation of the volumes of the two cuboids and then division of the larger volume by the smaller, or the working out how many small cartons would fit along each of the dimensions of the box (for example, 1000 ÷ 40 = 25). The latter approach was less successful, as many students who started well went on to add the 3 resulting values instead of multiplying them gaining one mark. A few worked out how many cartons would fit across one complete face of the box but almost invariably failed to proceed to use the third dimension. Also seen regularly but worth no marks was summing the three dimensions of the carton and the box and dividing the resulting numbers or attempting to work with the total surface areas.

Question 14

Both parts of this question were poorly attempted.

(a) Very few students gave the correct bearing, although there was no evidence of a lack of protractor being the problem. Many measured 60° instead of 121°, presumably from the anti-clockwise angle from *T* to *S* or a protractor scale misread or gave the distance from *S* to *T* instead.

(b) Many students gained no marks for this part of the question. Some students were awarded one mark for the calculation 13 ÷ 2 or for 6.5. This clearly is a topic that students find difficult at this level. Even when knowledge of bearings was apparent, accuracy in the use of a protractor was often poor (or missing). Many took the bearing from *T*.

Question 15

There were a good number of students who were able to make a correct start on this 4-mark, finding the mean from a grouped frequency table question. This involved using the mid interval values and the frequencies to find and sum products for 2 method marks. Some were then able to go on to divide by 60 and find a correct answer. Common errors were to divide their sum (= 2742) by 5 or by the sum of the mid interval values. A few students used end points rather than midpoints and could gain M2 if they divided by 60. A few tried to multiply each frequency by 6, the width of the class interval. There were a good number of students who gained no marks as they were unable to make a correct start at all. Unfortunately, there were some students who misunderstood the definitions of mode and mean and despite showing correct workings for the mean next to the table.

Question 16

Students often find working with two dimensional representations of three-dimensional shapes very difficult and in this question, they struggled to decide which lengths they needed to multiply to find the area of the surfaces. The most common mistake was to multiply the 4.8cm height by 6 or 7 and if they used 3.6cm, they then frequently forgot to divide by 2 to find the cross-sectional area. Another common error was 3.6 × 7 probably as they were adjacent on the diagram. It was very rare to see a completely correct solution to this question. However, some managed to gain the first mark for finding at least two different areas, usually the rectangular faces.

Question 17

Many students gained the full 3 marks here for working out the values of x, y and z. Some students continue to muddle the three terms and use of the mean was sometimes incorporated. Other students were awarded 2 marks for 2 of these conditions being met and 1 mark for only one of the conditions, with a small number not being able to score any marks.

Question 18

(a) Many students wrote down the answer of 9 as required. A minority of students gave an incorrect answer of 4

(b) Generally, students gained one mark for 2 terms correct as part of a product. The students who gained the one mark tended to write down $7m^7p^3$ or $10m^7p^2$. Many students found this part difficult.

Question 19

It was pleasing to see a good number of correct responses and some not fully correct but with working that enabled them to gain method marks. Some students correctly found 16% of $1600 but forgot or didn't realise the need to subtract it from $1600. Students should be reminded to take note of any question using percentages as to whether they are increasing, reducing or just giving the percentage of the amount. Some weaker students surprisingly used a non-calculator, break down approach to finding 16%, so 10% = $160, 5% = $80 etc or 1% = $16, these mostly proved to be incorrect as they did not add up the amounts correctly. The second mark was gained by some students by writing down 0.84 × 1600 or 1600 – 256 or for 1344. A common answer was to find 1344 and some students could not progress any further. Many students could not gain the third method mark as they did not have an understanding of any of the methods shown in the mark scheme. Students should read the question carefully.

Question 20

This question was poorly attempted. Some students were able to interpret the information correctly and divide 390 by 6 and then multiply by 15 to gain the correct answer of 975. Generally, students divided 390 by 15 and then tried to find the value of C without any success.

Question 21

There were many who failed to attempt this question. There was unfamiliarity about adjusting the equations to give the same coefficient of x or y, evidenced when students started to manipulate just one of the equations, or tried a trial and improvement approach. Of those who made a good start, it was not uncommon to find them making an arithmetic error or dropping a minus sign. If this was the only error they could then go on to the next step and potentially gain two of the three marks. For the second stage in their calculation, there were as many who started again with elimination as there were who substituted back in, though substitution was done with greater success.

Question 22

(a) This part was answered well.

(b) This part was quite challenging to many students, however, a few students only gained one mark. The students who attempted the question forgot to write the figure 240 000 in standard for. Some students wrote the final answer as 25×10^4 gaining the first method mark.

(c) This part was poorly attempted by many students as they could not deal with the index values. They could not use a calculator to evaluate the index numbers. A few students only gained one mark. The students who attempted the question tended to gain one mark for 18×10^{120}

Question 23

(a) It was encouraging to see a fair number of correct responses for factorising a two-term expression with common factors. Where full marks were not awarded, others gained one for a correct factorisation with at least two factors outside the bracket. There were also many and varied incorrect attempts, with $3c^5d^2$ being the most commonly seen incorrect answer. There were also many non-responses.

(b) (i) Many incorrect solutions were seen, and the main incorrect answer was to write the signs the wrong way round in the brackets e.g. $(y – 6)(y + 3)$ or $(y + 6)(y + 3)$ or $(y – 6)(y – 3)$; one mark was awarded for this. Some students tried to use the quadratic formula. Students should ensure they have the correct factors by multiplying back as a useful check for this type of question. Other incorrect answers such as $y(y – 1.5) – 18$ were seen.

(ii) This part of the question was poorly attempted. Many students tried to use the quadratic formula to solve the given equation.

Question 24

The majority of students gained no marks for this question because they failed to realise the need to find the perpendicular height of the triangle by the use of Pythagoras' theorem (or other less efficient methods). For students who did do this, the question became fairly straightforward. Stumbling blocks became remembering to square and subtract and to use the complete base for the area rather than half the base they had used in Pythagoras' theorem. Many students simply divide 42 by 7 giving an answer of 6 and making no further progress.

Question 25

This question was very poorly answered, suggesting that many students had not covered trigonometry as part of their course, or were insufficiently confident in the application of trigonometry. Many tried simply using the numbers in the question in a variety of incorrect calculations. Students with some knowledge of trigonometry usually selected sine as the function to use, although cosine and to a lesser extent tangent were sometimes their choice. The correct quoting of sin 52° was usually followed by a fully correct solution for the length of the radius. Some students however, having their calculators set on an incorrect mode, were unable to score 2 marks. Some students worked out the length of *OM* assuming this was the radius.

It was disappointing to see the students who managed to work out the value of the radius, 7.61 cm, using the incorrect formula or no formula at all to try and find the area of the circle. Many used the circumference formula or used the area formula but with the length of *OM* as the radius.

Summary

Based on their performance in this paper, students should:

- Recall the areas of a triangle and a circle
- learn the difference between LCM and HCF
- learn how to answer scale drawing questions and the use of a protractor
- show clear working when answering problem solving questions
- read the question carefully and review their answer to ensure that the question set is the one that has been answered
- make sure that their working is to a sufficient degree of accuracy that does not affect the required accuracy of the answer.

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