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Examiners' Report/ Principal Examiner Feedback

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Pearson Edexcel International A Level in Core Mathematics C1 (6663A) Paper 01

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Core Mathematics C1 (6663A)

General introduction

This Core Mathematics C1 paper had a range of standard and non-standard questions. Questions that proved to be more demanding to the candidates were numbers 5, 6(c), 7(c), 8, 9(b), 9(c) and 10(b). It also seemed like there was a very wide range of abilities in candidates sitting this examination. There were some extremely good responses showing a full and detailed knowledge of the syllabus, and others that showed limited understanding of the basic skills required in C1. On the whole, graphs were well drawn, algebra relatively sound, but arithmetic skills were lacking in areas on 6(c), 7 and 10(b).

Report on individual questions:

Question 1

This was found to be a gentle introduction into the paper for the vast majority of candidates, with many achieving full marks. Common errors seen in part (a) tended to involve the squaring of just one of the terms. Another relatively common mistake involved the expansion of $(2 + \sqrt{x})^2$. Most candidates knew how to start part (b) with most multiplying the numerator and denominator by $(2 - \sqrt{7})$. Candidates then proceeded to expand and simplify. Some did lose marks as a result of not spotting the common factor of 3 and hence left their expression unsimplified.

Question 2

This was generally well set out with answers being correctly labelled $\frac{dy}{dx}$, etc. The final mark in (a) and A mark in (b) were often lost, owing to the incorrect processing of the middle term of the original expression. The term $\frac{4}{\sqrt{x}}$ was often written as $4x^{\frac{1}{2}}$ or $4x^{-2}$. Very few candidates integrated. A sizeable minority of candidates thought that $\frac{d^2y}{dx^2}$ should be found by squaring $\frac{dy}{dx}$.

Question 3

This was a good source of marks with many scoring at least 5 marks. After producing an equation in just one variable (y being the most popular) most were able to find at least one complete solution. The solution of the equation $8y^2 - 16y = 0$ caused some issues with many only arriving at the solution $y = 2$. Another common loss of marks was caused when candidates stopped after solving for x or y. The corresponding values of y or x were missing.

Question 4

This was another very well done question. Many candidates scored 3 or 4 out of 4. Diagrams were mostly very clear with candidates demonstrating the correct transformations and marking the coordinates of the points as instructed. Where candidates dropped marks, the common errors were that in part (a), some translated the curve right with *P* moving to (8, 2) and in part (b), some doubled both coordinates and moved *P* to (8, 4).

Question 5

This was probably found to be the most demanding question on the paper judging by the quality of responses. Relatively few candidates gained full marks and there was much confusion between a_n and $\sum a_r$. Answers to parts (a) and (b) were commonly given as $a_5 = 112$ and $a_6 = 156$ respectively. Many candidates produced a sum in part (a), not realising that the answer to the question could be found by substituting in $n = 5$. Working out $12 + 4(112)^2$ appeared a few times in part (b), but was rarely preceded by a knowledge of how to find a_6.

Question 6

This was a question about straight lines. Candidates were familiar with finding gradients, intercepts and equation of lines. Consequently parts (a) and (b) were well done. Candidates did lose marks as a result of not setting the equation in the form $y = mx + c$, but these were in the minority. Most candidates knew how to find the gradient of a perpendicular line. Part (c) was more unstructured and this resulted in many candidates not knowing how to proceed. The candidates who did know what to do found the arithmetic very difficult to handle. The most successful candidates found the distances *AB* and *AC* by Pythagoras and simplified their 'surds' before multiplying. The correct answer then dropped out fairly easily.

Question 7

Most candidates were well prepared for this question with very few making no attempt. Most quoted and tried to use the correct formulae with the correct value of *n*, although misquoting the sum formula as $\frac{n}{2}\{a + (n - 1)d\}$ was seen on a few occasions. In (a) most used the formula for the nth term with values of *a*, *d* and *n*. Some concluded that $n = 9$ after using 26 000 in the formula. Whilst part (b) was mostly correct, few candidates gained full marks in part (c). The most common errors seen were: equating the sum formula to 26 000 for Anna to find her salary in the first year, using the sum formula with $n = 10$ to find Shelim's total salary (instead of $S_9 + 26\,000$) or indeed using S_9 for Shelim instead of finding his total salary for 10 years. One error that was repeated on many occasions was 26 000 – 9000 = 15 000.

Question 8

This was found to be very demanding. Candidates generally knew that the roots of an equation were linked to the discriminant but many did not know how. There was evidence of incorrect formulae and incorrect knowledge of what was a, b and c. Full marks in part (b) was very rare. Many candidates were desperate for the quadratic to factorise and gave up when they could not get it to work. Those who did proceed to find the two critical values by either completing the square or the formula merely chose the inside interval without reference to the inequality. As a consequence only the best candidates scored full marks.

Question 9

Many candidates realised that this question involved integration and therefore, the brackets needed to be expanded first. This was very well done by the majority of candidates but the use of the given point to calculate 'c' resulted in the loss of the final two marks for many. In part (b) the substitution of the point into $f(x)$ should have resulted in finding the constant 'p' straight away. Once p had been found it should have been a simple case of multiplying out $(x-2)^2(x+3)$ to show that it was the same as part (a). Most candidates worked with part (a) and attempted to divide by $(x-2)$ or $(x-2)^2$. Good candidates achieved this, but it was beyond the reach of many. In part (c) most attempted some form of cubic but complete solutions were rare. In sketching a graph it is important to mark all intersections with the axes. The common errors seen were a maximum rather than a minimum at (2, 0) and the lack of a y-intercept.

Question 10

Candidates who knew that the gradient of a curve could be found by differentiation tended to do well in part (a). As a result, there were many completely correct solutions to this part. A few candidates attempted gradients from points on their line, but these were in the minority. Part (b) was found to be very demanding. Only a minority of candidates realised that they had to use their $\frac{dy}{dx}$ from part (a). Those that did rarely could cope with the fraction work required to complete the solution. A sizeable number of candidates set $3x-5$ equal to the equation of the curve and attempted to solve.

Grade Boundaries

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