Examiners' Report/ Principal Examiner Feedback

January 2014

Pearson Edexcel International A Level in Core Mathematics C2 (6664A) Paper 01

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Core Mathematics C2 (6664A)

General introduction

Candidates found some of the paper accessible and standard methods were known but certain areas proved to be less well known, trigonometry in particular. There were a significant number of examples later in the paper where questions were left blank or where very little work was seen. Quite a few candidates were unable to process indices correctly. The questions that proved most challenging were 5, 7, 8 and 9.

Presentation was sometimes poor.

Report on individual questions

Question 1

This question was well done by the vast majority of candidates. Many could write down the expressions for the first two terms correctly although quite a few candidates failed to square the *p* in the third term. This led to the incorrect equation $66p = q$ and a value for *q* of 99. A surprising number of candidates who could deal with the binomial expansion then stopped, not realising that the comparison of coefficients was needed.

Question 2

The methods here were well known with candidates using the remainder and factor theorems successfully, although some of them possibly did not read the question carefully enough and used $f(-3) = 25$ in part (b). Relatively few resorted to long division and those who did were less successful. The requirement to solve two linear simultaneous equations in part (b) was often successfully met but there were a significant number of cases where there were basic algebraic or arithmetic errors in obtaining the values of *a* and *b*.

Question 3

In part (a) the differentiation was usually very sound but the equation in part (b) proved to be difficult to solve for many. Attempts were made to factorise $x^{-\frac{1}{2}} - 9x^{-\frac{3}{2}}$ but with incorrect conclusions, e.g. $x^{-\frac{1}{2}} - 9x^{-\frac{3}{2}} = 0 \Rightarrow x^{-\frac{1}{2}}\left(1 - 9x^{-1}\right) = 0 \Rightarrow x = 0$ or $x = 9$. Other attempts at factorising showed a lack of understanding of indices e.g. $x^{-\frac{1}{2}} - 9x^{-\frac{3}{2}} = x^{-\frac{1}{2}}\left(1 - 9x^{3}\right)$. Although the question asked for the coordinates of the stationary point of the curve, many of those, with a correct value for *x*, did not find the *y*-coordinate. Those who attempted part (c) opted to use the second derivative method but a surprising number of candidates made no attempt at this part of the question.

Question 4

Candidates were very successful in part (a) and were able to apply the term and sum formula for a geometric series correctly. The most common mistakes were to use $n = 19$ in (ii) or not to give the answers to the required accuracy. A small minority treated the whole question as an arithmetic series. Part (b) was met with less success and although the majority were at least able to translate the given condition into an equation or inequality, the subsequent work sometimes included errors both in the processing of indices and/or logarithms.

Question 5

This question proved to be one of the most difficult on the paper. In part (a) many candidates substituted $t = 60$ despite the fact that t was specified as being in hours. The processing needed in (b) defeated the majority and often, little progress was made beyond $\arcsin\left(\frac{1}{5}\right)$ or

$\arcsin\left(-\frac{1}{5}\right)$. There were common misconceptions such as $\sin\left(\frac{\pi t}{6}\right) = t\sin\left(\frac{\pi}{6}\right)$ and $\sin\left(\frac{\pi t}{6}\right) = \frac{\sin(\pi t)}{6}$. Those candidates who did go on to attempt to solve their trigonometric equation often misunderstood the requirement and did not appreciate that times were needed. Very few candidates could find the two correct times.

Question 6

This question proved to be a good discriminator. There were some misunderstandings regarding the properties of logs e.g. $\log(7y + 1) - \log(2y) = \log(7y + 1 - 2y)$ but most candidates could at least gain one mark by using a correct property of either $\log(7y+1) - \log(2y) = \log\frac{7y+1}{2y}$ or $\log_x x = 1$. Those candidates who managed to obtain a correct equation in x and y often struggled to make y the subject. A common incorrect solution was $\log(7y+1) - \log(2y) = 1 \Rightarrow \frac{7y+1}{2y} = 1 \Rightarrow y = -\frac{1}{5}$.

Question 7

Presentation in (a) was often good although some candidates failed to appreciate that calculus was required and attempted a gradient using the points (4, 9) and (0, 5). Some who did differentiate sometimes set their derivative to zero and used the resulting values of x to attempt a gradient.

A variety of methods was used in part (b) to establish the required area. The most common method was to use integration separately on the line and the curve and then subtract at the end although some candidates used incorrect limits. Some candidates successfully found the area using one integration and others found the area under the line as a trapezium. A significant number of candidates just found the area under the curve.

Question 8

Most candidates could write down the equation of the circle in part (a) although some left it in the form $(x - a)^2 + (y - b)^2 = 25$.

In part (b) many candidates could successfully establish the equation of the line although quite a few effectively wrote down the printed answer and scored few marks, if any. A wide variety of methods were used in (c) to show the required angle with the cosine rule being the most common.

There were some false assumptions in part (d) such as, $OR = 5$, triangle POQ = triangle PRQ and $POQR$ is a square. Candidates who used the diagram to help identify a suitable strategy were often more successful.

Question 9

The correct trigonometric identity was often used in part (a) although there were a surprising number of slips involving signs in attempting to establish the printed answer.

In part (b) many failed to see the connection to part (a) and started again. Also a large number of candidates failed to see the double angle and it was quite common to see final answers of 19.47 and 160.53. Only a small minority could correctly find all four required angles.

Grade Boundaries

Grade boundaries for this, and all other papers, can be found on the website on this link:
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