Examiners' Report
Principal Examiner Feedback

Summer 2019

Pearson Edexcel GCE AS Mathematics In
Core Mathematics C2 (6664/01)

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Question 1

On the whole this question was well done, with far fewer of the usual bracketing mistakes or uses of h=2/5. There were a few who used h = 2 however. Some candidates were unable to reach the correct answer despite having the correct expression written down, presumably due to an inability to use their calculator accurately.

Question 2

This question was completed very well with many candidates gaining full marks.
In part (a) most used the factor formula correctly and obtained a correct value for a. In part (b) division was by far the most popular method of finding factors although other methods were well done.
Candidates lost marks by failing to factorize their quadratic or by careless errors. Some wasted time by going on to solve the equation.

Question 3

Most candidates were able to attempt a binomial expansion, using the correct binomial coefficients with the correct powers of x. There were the usual missing brackets so that only the x was squared and not the k. The majority of expansions were given in the correct simplified form. Candidates who were able to make a decent attempt at finding the exact value of k did not always read the part of the question that stated that k was a positive constant and so gave both the positive and negative values that satisfied their equation. These candidate lost a mark in part (b) but were able to achieve full marks in (c). In part (b) too many candidates are still leaving the powers of x in their equations rather than just equating coefficients. Some equated the wrong coefficients because they did not read the question carefully.

Question 4

For some, the question was straightforward and full marks were attained. Others mixed up the use of formulae and failed to read the detail of the question.
(a) Accepting = or < or > allowed many to gain the first M1 with = the most popular. Some did change their sign part way through their solution. Similarly n or $n - 1$ allowed many to gain the first A1 with a power of n very common.
Candidates mistakenly used 0.1, 0.9, or 1.01 for their value of r on many occasions and so lost accuracy marks.
A few did use the sum of series formula in part (a) and only gained one of the four marks if they solved a power equation with correct log work.
Use of logs was good for most with many getting a correct answer but many failed to answer the question and to deduce that 2034 was the significant year.
(b) This was very well completed with most using the sum formula correctly. A power of '11' was the most common error.

Question 5

It was pleasing to see how many candidates were able to correctly identify the centre of the circle, but equally disappointing to find too many still muddling up completing the square and unable to find the correct radius. Candidates should be encouraged to write their working more clearly as in some cases they themselves seem unable to follow and lose track of whether they are using *r* or *r* squared.

Part (c) required the equation of a vertical line. Many candidates found a gradient of zero and so gave the equation $y = -3$. Some candidates did this even with a diagram showing a vertical tangent at the given point. A level candidates should really know how to write the equation of such lines. Many candidates found spurious gradients of 7/12 or similar and proceeded to use $y - y_1 = m(x - x_1)$ to find the equation of a line.
A small number used implicit differentiation but again had no idea what to do when the gradient

(93-10)/0 was undefined on their calculator.

Question 6

Many found a straightforward method of answering the question by either subtracting equations of 'line - curve' and integrating, or finding areas of trapezium and area under curve and easily gained full marks.
Integration was completed extremely well by all candidates and for the weaker ones the two marks for integration were often the only marks gained.
Some complicated methods were employed such as integrating in parts e.g. -12.5 to -8 and -8 to 0 and 0 to 4. Areas of large and small triangles were also included.
On the whole candidates used the correct limits but some did include 66 and 48.

Question 7

Most candidates were able to attempt part (a), replacing $\cos^2 x$ by $1 - \sin^2 x$ and proceeding to the given answer. Even if they had been unsuccessful, the structure of the question allowed them to achieve full marks in part (b). Unfortunately there were candidates who either did not realise the connection between parts (a) and (b) or simply made a sign error in their copying. Where candidates correctly solved the trigonometric quadratic equation, many found only one positive solution, or one pair of solutions, rather than all four required solutions. Candidates using a CAST diagram were less successful at solving $\sin 2y = -2/3$

Question 8

Part (i) was usually answered correctly with candidates replacing the log to the base *x* by an equation in x^3.
Part (ii) was usually answered using Way 1 on the mark scheme. Most candidates answered the log work well and errors tended to be simple algebraic manipulation errors. Many realised that $x^5 = 2187$ but finding *x* as a power of 3 from this caused difficulties for a sizeable group.

Question 9

A difficult question for some. Parts (a) and (b) were the most successfully answered. Candidates who used diagrams to explain their working/method seemed to do better. In part (a) the cosine rule was used successfully with most gaining full marks. Some had difficulty manipulating the formula and others lost a mark by not giving 3sf or working in degrees. A small number forgot the existence of the cosine rule and assumed angle DAC to be 90 degrees and used trigonometric formulae associated with a right angled triangle. Part (b) was completed well even if some forgot to double the angle In part (c) many found difficulties. Using the segment formula with the correct angles was very successful. Using diagrams in working helped their explanations with many using areas of sector minus areas of triangles to gain full marks. Some included the area of the whole kite and spent a few pages of working attempting their method by long and elaborate methods. Carelessness with angles meant some failed to gain full marks.

Question 10

Part (a) was completed very well by those finding area of the triangle using the formula $1/2ab \sin C$. Less successful were those who attempted to find the height of the triangle as they struggled to work with the square root from Pythagoras theorem. A disappointing number of candidates thought the area of the triangle was $1/4\, x^2$, and did not realise the angle was 60 degrees. Some candidates produced area equations that included either lengths (x terms) or volumes (x^3 terms). The perimeter equation $P = 3x+6y$ was found by most candidates.

Part (b) was answered well and most managed to correctly differentiate P although a large proportion lost the final mark as they stopped at finding an x value and did not calculate the minimum perimeter P. Algebraic manipulation and dealing with the $6/x^2$ term caused problems for many in calculating x and thus P. Rounding x prematurely lost both the final two accuracy marks but only a few candidates did this.

In Part (c) most candidates understood the need to find the second derivative and were generally successful in substituting in their x value and coming to the correct conclusion. A few concluded that, as their value was positive, they had found a maximum.

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