Examiners' Report
Principal Examiner Feedback

Summer 2023

Pearson Edexcel GCE
Further Mathematics (8FM0)
Paper 22 Further Pure Mathematics 2

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Question 1

Candidates found that this was a good starter question and they were able to demonstrate their understanding of what a group is.
Part (a) was very accessible for all candidates, the majority scored 2 out of 2
Part (b) Candidates clearly knew the axioms of a group and the majority were able to explain why G was a group.
Part (c) Candidates clearly knew the term cyclic group and were able to give a reason why G was not cyclic.

Question 2

(a) The majority of candidates knew the process required to find the eigenvalues of a matrix, finding a quadratic equation. Most candidates knew how to deal with repeated eigenvalue and attempted to find the value of k and the eigenvalue. There were a few slips with algebra.
(b) Those candidates who successfully achieved the correct values $k = 16$, eigenvalue = 1 used these to find the Cartesian equation of the invariant line. Candidates with an incorrect eigenvalue struggled with this part.

Question 3

Part (a) the majority of candidate knew that the loci formed a semi-circle with end point (4, 1) and (2, 7). The majority knew that the semi-circle was above the points, one candidate drew below.
Part (b) was more demanding for candidates with quite a few candidates not making any attempt. Candidates are reminded to use a diagram to help them understand what to do. They needed to find the coordinates of the centre of the circle and the distance from the centre to the origin plus the radius.

Question 4

(a) Virtually all candidates were able to state the correct value of A and explain in context the value 1.005
(b) This proved more demanding, only about half the candidates were successful. The incorrect form of the geometric series was the issue for other candidates.
(c) Candidates who were successful in part (b) went on to correctly answer this part. Setting their answer to part (b) = 1000 and solves to find a value for n.

Question 5

(i) About half the candidates were successful with this part, recognising the need to find $214 \equiv 6 \pmod 8$ then use this to show that 214^6 is divisible by 8

(ii) (a) Some candidates who were unsuccessful in (i) managed to score marks in this part. Using the divisibility of 11 rule $a-5+b-8+a-b+0=11n$ to find the value of a.
(ii) (b) Most candidates were able to use the sum of the digits is divisible by 3 to find at least 2 correct possible values of b. The common error was to miss out $b = 0$ as a possible value.

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