Examiners' Report
Principal Examiner Feedback

Summer 2024

Pearson Edexcel GCE
Further Mathematics (8FM0)
Paper 26 Further Mechanics 2

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Report on Paper 8FM0 26

Introduction

This paper was generally well received with the vast majority of candidates able to attempt all questions. It was also notable that a good number of candidates were able to access later parts of questions even if they had struggled to complete the first part.
One significant issue throughout for many candidates was geometry. In question 2, many did not realise that the radius of the sphere meant the distance $OB = a$ and in question 4 lots of candidates thought the centre of mass of a triangle was one third the distance from a vertex. Candidates must also realise that when a question has a given answer their working needs to be accurate and correct. A great many lost marks by dropping and then recovering terms from their equations or by failing to give the conclusion as printed.

Report on Individual Questions

Question 1

(a) The overwhelming majority of candidates understood how to approach this part but many lost marks through inaccurate working: often this was through dimensionally incorrect equations (for example, missing a throughout) which they attempted to recover at the end. Candidates must also realise that where an answer is given their conclusion must be the same: a significant number of otherwise strong candidates lost the final mark for never referencing d in their solution.

(b) Almost all candidates successfully found $\bar{y}$ although a small number proceeded no further. Incorrect responses usually involved either unsuccessful use of trigonometry or losing the a from the final answer.

Question 2

(a) Most candidates recognised the need to resolve forces and while the majority did so horizontally and vertically, common errors included equating R to $mg\sin\theta$. A significant number of candidates who resolved correctly were then unable to apply the geometry of the situation to change their equation in r or a to one in h.

(b) A large number of candidates did not attempt part (b) but it was well answered by those who did, including those who had not completed part (a). A common error was to change the weight of the particle to $3mg$.

(c) Common incorrect answers included claiming that the particle had no mass/weight or that there was no friction.

Question 3

(a) A significant minority of candidates were unable to separate the variables, instead simply trying to integrate $4 – 3v$ with respect to v in order to find the velocity. For those that adopted the correct approach it was pleasing to see most remember the constant of integration and the algebraic working was generally good if occasionally inefficient. However, a number of candidates made sign errors in their working which they later recovered, and this was penalised via the final mark as the question gave a printed answer.

(b) Many candidates answered this part well, including those with an incorrect k. A significant number either did not find a constant of integration or did so using incorrect values of t and x.

Question 4

(a) As with question 1, a large number of otherwise strong candidates lost marks in this part because they had dimensionally incorrect equations (too much cancelling of a) or did not reference the d in the question. The majority of problems for those who struggled were incorrect distances of the centres of mass, with triangles in particular a problem.

(b) The vast majority of candidates made good progress by finding a vertical distance and the majority proceeded correctly but a number found the angle with the horizontal instead. The weakest attempts were often those who tried to find a distance of the centre of mass from A and then use cosine or sine trigonometric ratios.

(c) This part was found by most candidates the hardest with many of them scoring no marks. A number of candidates successfully found the centre of mass of the combined shape then took moments. The most common incorrect responses included a moments equation with either no distance term with X or an incorrect distance of $9a$, or moments about somewhere other than A which forgot to include a tension or equivalent force.

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