

**AQA – Poisson distribution – A2 Further Mathematics Statistics****1. June/2021/Paper\_7367/3S/No.8**

A company records the number of complaints,  $X$ , that it receives over 60 months. The summarised results are

$$\sum x = 102 \quad \text{and} \quad \sum (x - \bar{x})^2 = 103.25$$

- (a) Using this data, explain why it may be appropriate to model the number of complaints received by the company per month by a Poisson distribution with mean 1.7  
**[3 marks]**

- (b) The company also receives enquiries as well as complaints. The number of enquiries received is independent of the number of complaints received.

The company models the number of complaints per month with a Poisson distribution with mean 1.7 and the number of enquiries per month with a Poisson distribution with mean 5.2

The company starts selling a new product.

The company records a **total** of 3 complaints and enquiries in one randomly chosen month.

Investigate if the mean total number of complaints and enquiries received per month has changed following the introduction of the new product, using the 10% level of significance.

**[6 marks]**

- (c) It is later found that the mean total number of complaints and enquiries received per month is 6.1

Find the power of the test carried out in part (b), giving your answer to four decimal places.

**[4 marks]**