

- 9 At the beginning of the academic year, all the pupils in year 12 at a college take part in an assessment. Summary statistics for the marks obtained by the 2021 cohort are given below.

$$n = 205 \quad \Sigma x = 23\,042 \quad \Sigma x^2 = 2\,591\,716$$

Marks may only be whole numbers, but the Head of Mathematics believes that the distribution of marks may be modelled by a Normal distribution.

(a) Calculate

- The mean mark
- The variance of the marks

[2]

(b) Use your answers to part (a) to write down a possible Normal model for the distribution of marks.

[2]

One candidate in the cohort scored less than 105.

(c) Determine whether the model found in part (b) is consistent with this information.

[3]

(d) Use the model to calculate an estimate of the number of candidates who scored 115 marks. [2]