BECA / Huson / 11.1 IB Math SL Name:
7 May 2018

Classwork: Statistics practice

Answer in the space provided

1a. Ten students were surveyed about the number of hours, *x*, they spent browsing the Internet during week 1 of the school year. The results of the survey are given below.

$$\sum_{i=1}^{10} x_i = 252,\ \sigma = 5 \text{ and median} = 27.$$

Find the mean number of hours spent browsing the Internet. *[2 marks]*

1b. During week 2, the students worked on a major project and they each spent an additional five hours browsing the Internet. For week 2, write down

(i) the mean;

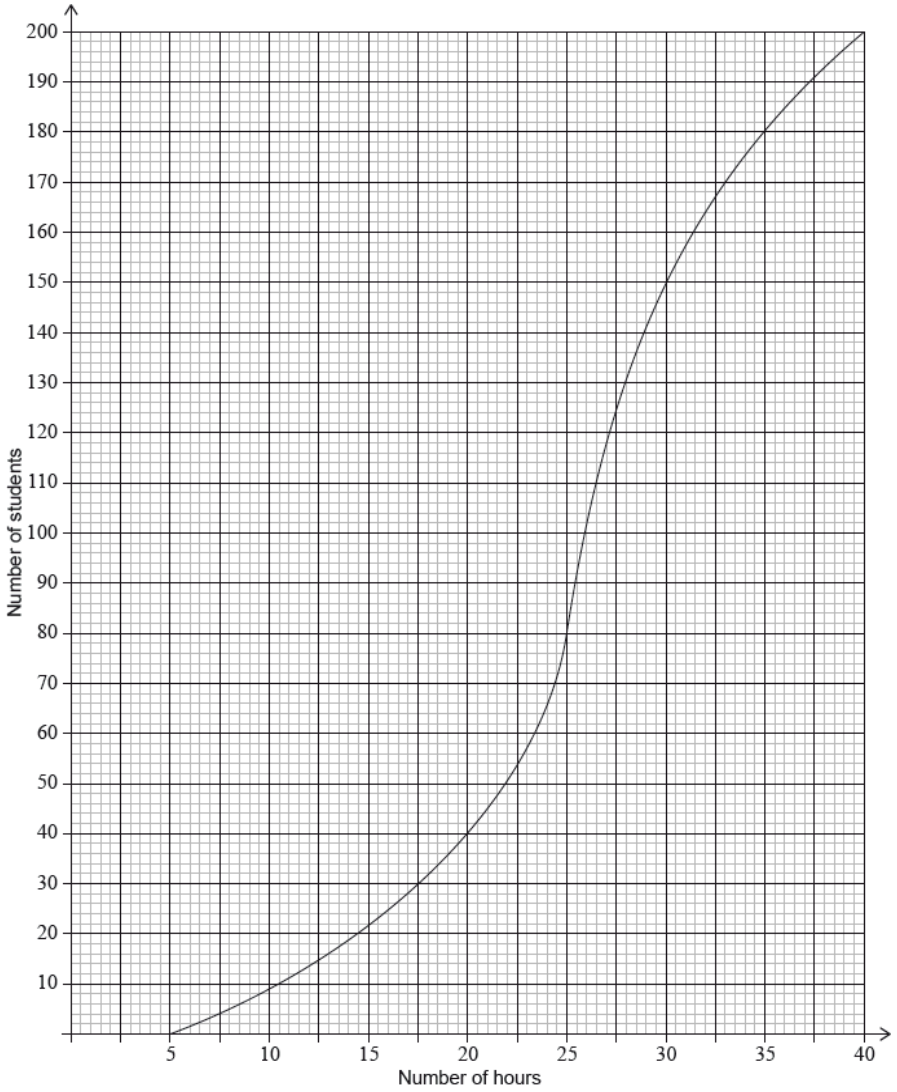
(ii) the standard deviation. *[2 marks]*

1c. During week 3 each student spent 5% less time browsing the Internet than during week 1. For week 3, find

(i) the median;

(ii) the variance. *[6 marks]*

1d. During week 4, the survey was extended to all 200 students in the school. The results are shown in the cumulative frequency graph:



(i) Find the number of students who spent between 25 and 30 hours browsing the Internet.

(ii) Given that 10% of the students spent more than k hours browsing the Internet, find the maximum value of k. *[6 marks]*

1e. Complete the frequency table

Hours	5-10	10-15	15-20	20-25	25-30	30-35	35-40
Frequency							
Cumulative frequency							

2a. Consider the following sequence of figures.

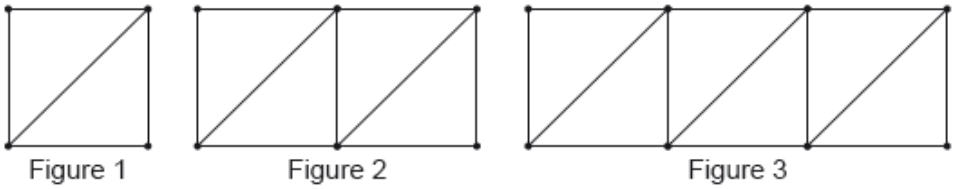
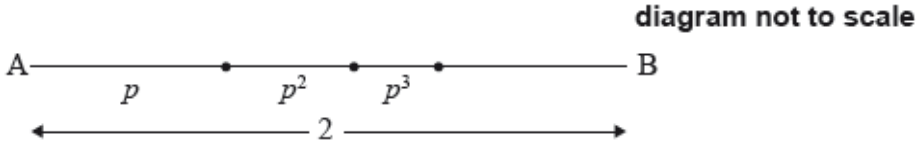


Figure 1 contains 5 line segments.

Given that Figure n contains 801 line segments, show that $n = 200$. *[3 marks]*

2b. Find the total number of line segments in the first 200 figures. *[3 marks]*

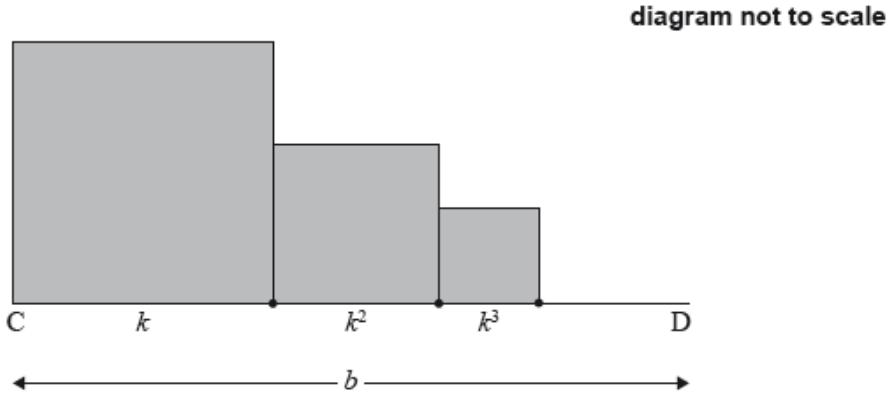
3a. The following diagram shows [AB], with length 2 cm. The line is divided into an infinite number of line segments. The diagram shows the first three segments.



The lengths of the line segments are p cm, p^2 cm, p^3 cm, $\ldots$, where $0 < p < 1$.

Show that $p = \frac{2}{3}$. *[5 marks]*

3b. The following diagram shows [CD], with length b cm, where $b > 1$. Squares with side lengths k cm, k^2 cm, k^3 cm, $\ldots$, where $0 < k < 1$, are drawn along [CD]. This process is carried on indefinitely. The diagram shows the first three squares.



The **total** sum of the areas of all the squares is $\frac{9}{16}$. Find the value of b. *[9 marks]*