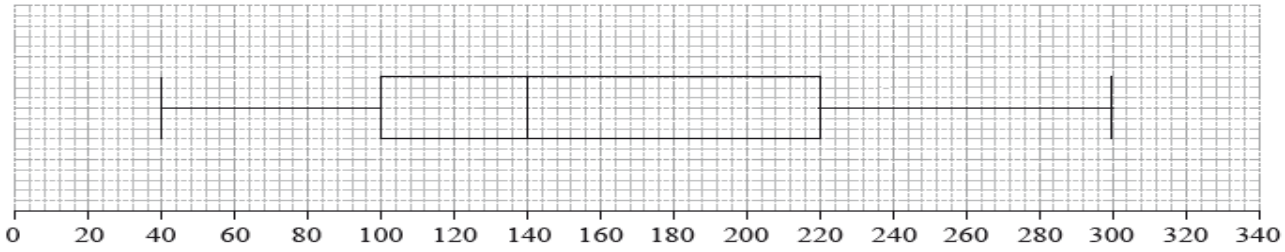
Name: _____ Date: _____
IB Math Studies / SL Ms. Guarnaccia / Dr. Huson

Statistics Review Problem Set 2

1a. *[3 marks]*
The time, in minutes, that students in a school spend on their homework per day is presented in the following box-and-whisker diagram.



Time, in minutes, students spend on their homework per day

Find

(i) the longest amount of time spent on homework per day;

(ii) the interquartile range.

. . . . . .
. . . . . .
. . . . . .

1b. *[1 mark]*

State the statistical term corresponding to the value of 140 minutes.

. . . . . .
. . . . . .
. . . . . .

1c. *[2 marks]*

Find the percentage of students who spend

(i) between 100 and 140 minutes per day on their homework;

(ii) more than 100 minutes per day on their homework.

. . . . . .
. . . . . .
. . . . . .

2a. *[1 mark]*

In a particular week, the number of eggs laid by each hen on a farm was counted. The results are summarized in the following table.

Number of eggs	1	2	3	4	5	6
Frequency	4	7	12	10	14	13

State whether these data are discrete or continuous.

. . . . . .
. . . . . .
. . . . . .

2b. *[2 marks]*

Write down

(i) the number of hens on the farm;

(ii) the modal number of eggs laid.

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. . . . . .
. . . . . .

2c. *[3 marks]*

Calculate

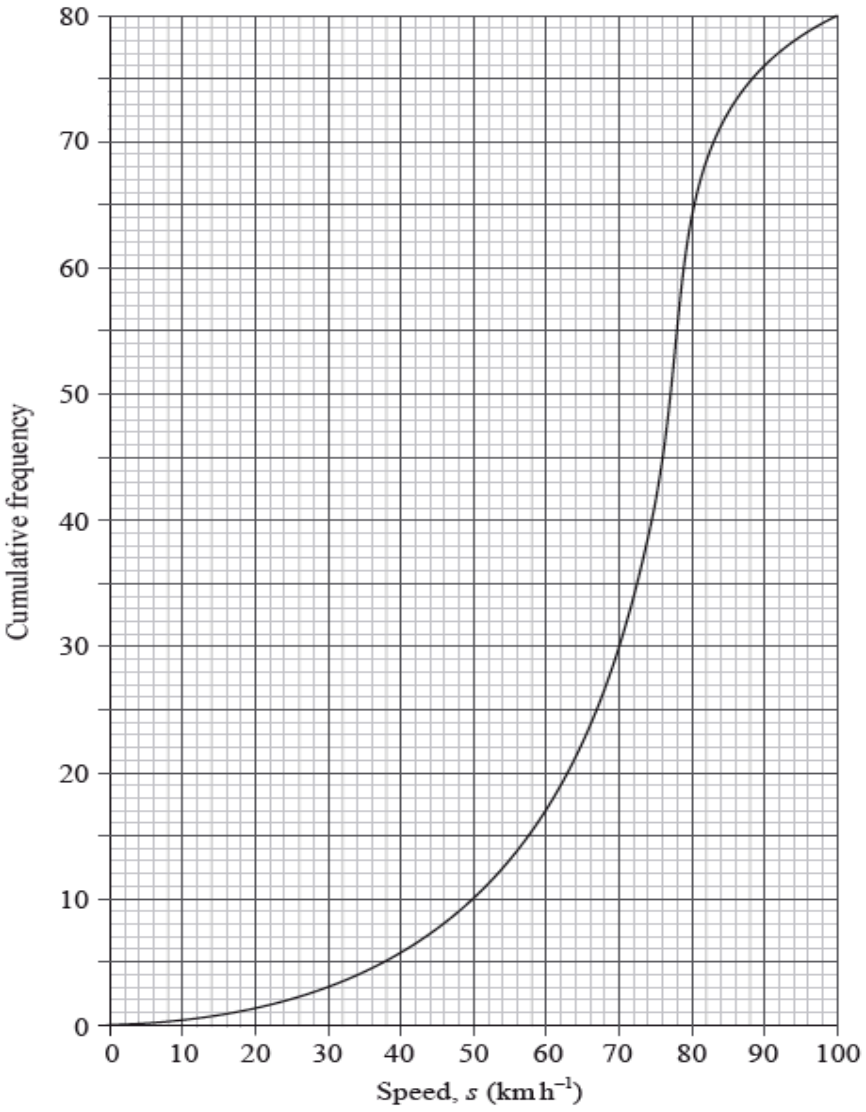
(i) the mean number of eggs laid;

(ii) the standard deviation.

. . . . . .
. . . . . .
. . . . . .

3a. *[1 mark]*

The cumulative frequency graph represents the speed, s, in km h^{-1}, of 80 cars passing a speed camera.



Write down the number of cars passing the camera with speed of less than or equal to 50 km h^{-1}.

. . . . . .

. . . . . .

. . . . . .

3b. *[1 mark]*

Complete the following grouped frequency table for s, the speed of the cars passing the camera.

$s\left(\text{km h}^{-1}\right)$	$0 < s \leq 50$	$50 < s \leq 70$	$70 < s \leq 80$	$80 < s \leq 90$	$90 < s \leq 100$
Frequency			34		4

3c. *[1 mark]*

Write down the mid-interval value of the $50 < s \leqslant 70$ interval.

. . . . . .

. . . . . .

. . . . . .

3d. *[3 marks]*

Use your graphic display calculator to find an estimate of

(i) the mean speed of the cars passing the camera;

(ii) the standard deviation of the speed of the cars passing the camera.

. . . . . .

. . . . . .

. . . . . .

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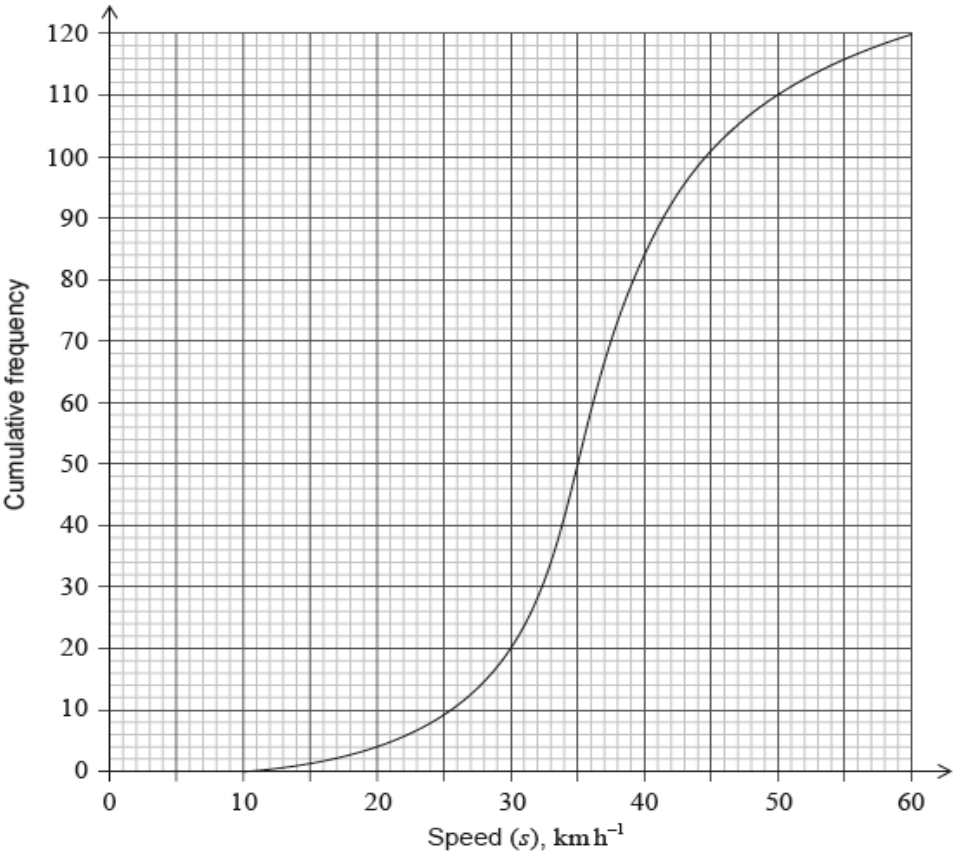
4a. *[2 marks]*

The cumulative frequency graph shows the speed, s, in km h^{-1}, of 120 vehicles passing a hospital gate.



The table shows the speeds of these vehicles travelling past the hospital gate.

Speed of Vehicles	Number of Vehicles
$0 < s \leq 10$	0
$10 < s \leq 20$	p
$20 < s \leq 30$	16
$30 < s \leq 40$	64
$40 < s \leq 50$	26
$50 < s \leq 60$	q

Find the value of p and of q.

. . . . . .
. . . . . .
. . . . . .

4b. *[2 marks]*

The table shows the speeds of these vehicles travelling past the hospital gate.

Speed of Vehicles	Number of Vehicles
$0 < s \leq 10$	0
$10 < s \leq 20$	p
$20 < s \leq 30$	16
$30 < s \leq 40$	64
$40 < s \leq 50$	26
$50 < s \leq 60$	q

(i) Write down the modal class.

(ii) Write down the mid-interval value for this class.

. . . . . .
. . . . . .
. . . . . .

4c. Use your graphic display calculator to calculate an estimate of

(i) the mean speed of these vehicles;

(ii) the standard deviation. *[3 marks]*

. . . . . .
. . . . . .
. . . . . .

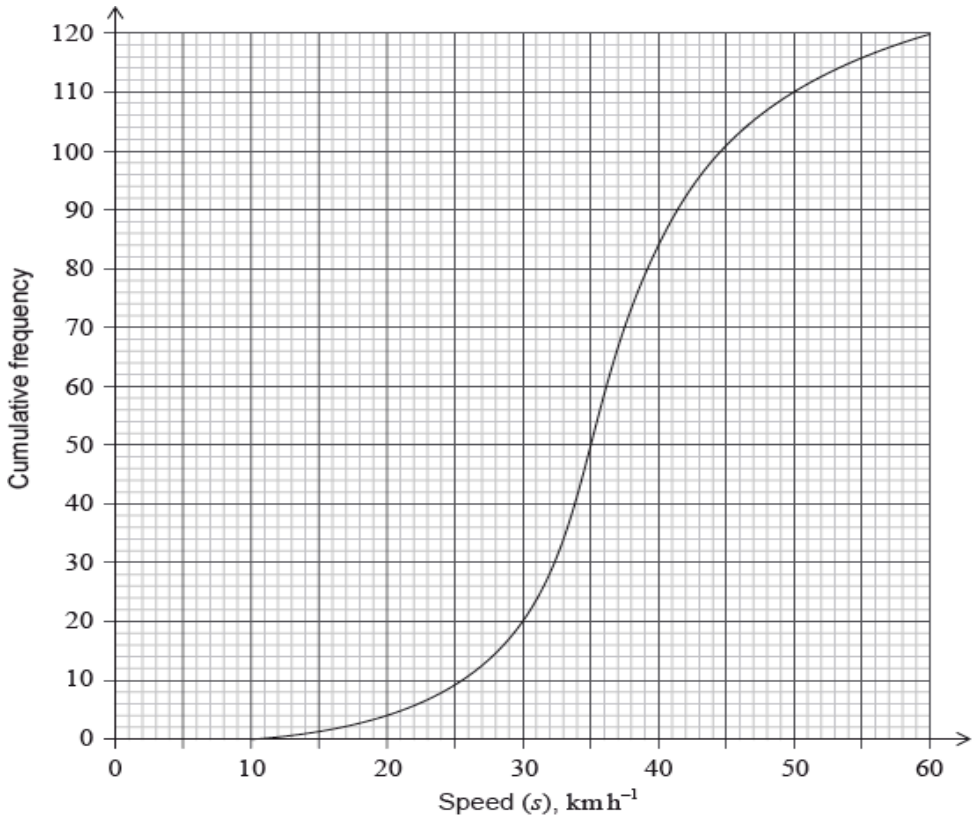
4d. *[2 marks]*

It is proposed that the speed limit past the hospital gate is reduced to 40 km h^{-1} from the current 50 km h^{-1}.

Find the percentage of these vehicles passing the hospital gate that **do not** exceed the current speed limit but **would** exceed the new speed limit.

. . . . . .
. . . . . .
. . . . . .

4e. The cumulative frequency graph shows the speed, s, in km h^{-1}, of 120 vehicles passing a hospital gate.



Estimate the minimum possible speed of one of these vehicles passing the hospital gate. *[1 mark]*

4f. Find the median speed of the vehicles. *[2 marks]*

4g. Write down the 75^{th} percentile. *[1 mark]*

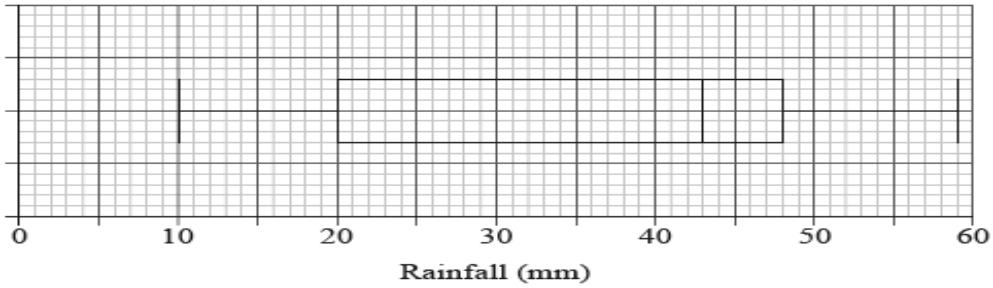
4h. Calculate the interquartile range. *[2 marks]*

4i. The speed limit past the hospital gate is $50\ \text{km h}^{-1}$.

Find the number of these vehicles that exceed the speed limit. *[2 marks]*

5a. *[1 mark]*

The distribution of rainfall in a town over 80 days is displayed on the following box-and-whisker diagram.



Write down the median rainfall.

5b. *[1 mark]*

Write down the minimum rainfall.

5c. *[2 marks]*

Find the interquartile range.

5d. *[2 marks]*

Write down the number of days the rainfall will be

(i) between 43 mm and 48 mm;

(ii) between 20 mm and 59 mm.

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Statistics Review Problem Set 3

6a. *[3 marks]*

A class of 15 students were asked how many pencils they bring to class. The following results were recorded:

$5,\ 7,\ 4,\ 5,\ 6,\ 7,\ 7,\ 4,\ 6,\ 5,\ 4,\ 6,\ 7,\ 2,\ 11$

For these results, write down

(i) the median;

(ii) the mode.

. . . . . .

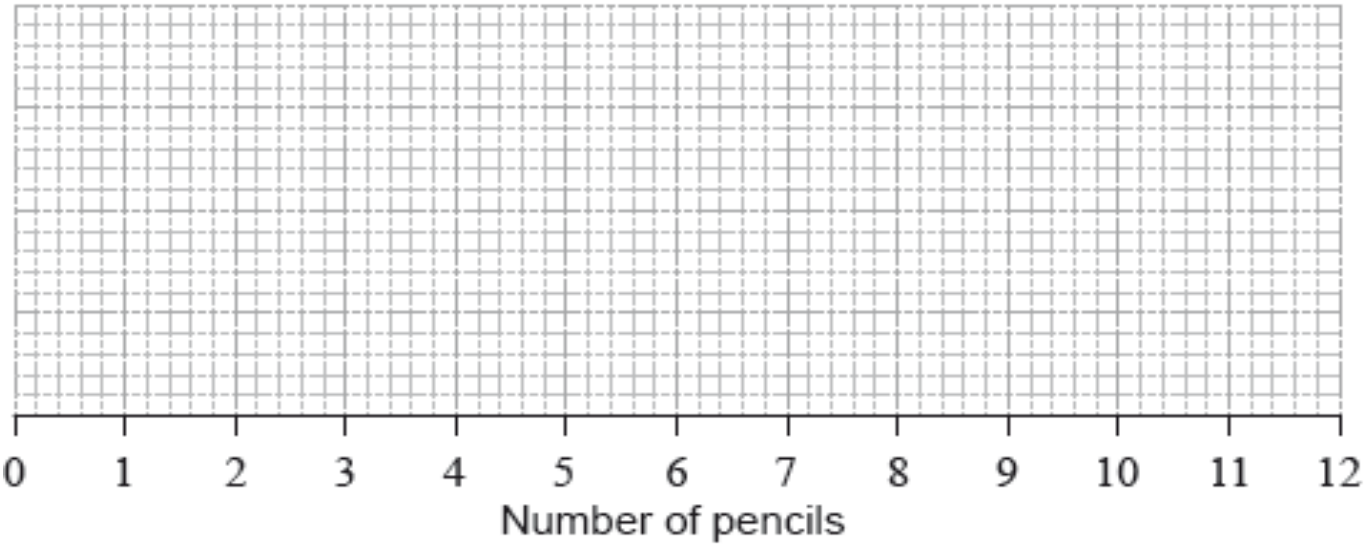
. . . . . .

. . . . . .

6b. *[3 marks]*

The upper and lower quartiles of these results are 4 and 7, respectively.

Draw a box-and-whisker diagram to represent these results.



7a. *[2 marks]*

The IB grades attained by a group of students are listed as follows.

6 4 5 3 7 3 5 4 2 5

Find the median grade.

. . . . . .
. . . . . .
. . . . . .

7b. *[2 marks]*

Calculate the interquartile range.

. . . . . .
. . . . . .
. . . . . .

7c. *[2 marks]*

Find the probability that a student chosen at random from the group scored at least a grade 4.

. . . . . .
. . . . . .
. . . . . .

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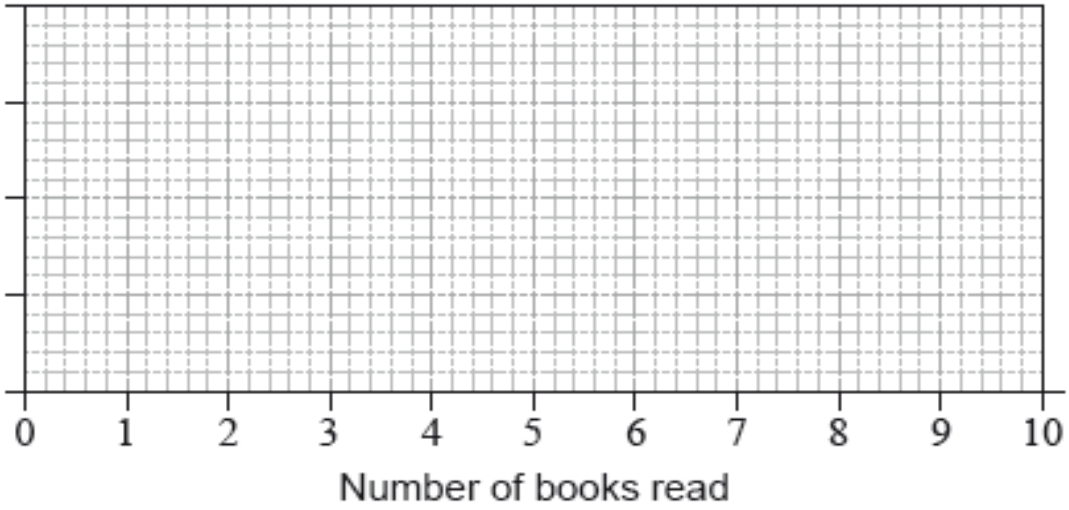
8a. Two groups of 40 students were asked how many books they have read in the last two months. The results for **the first group** are shown in the following table.

Number of books read	Frequency
2	5
3	8
4	13
5	7
6	4
7	2
8	1

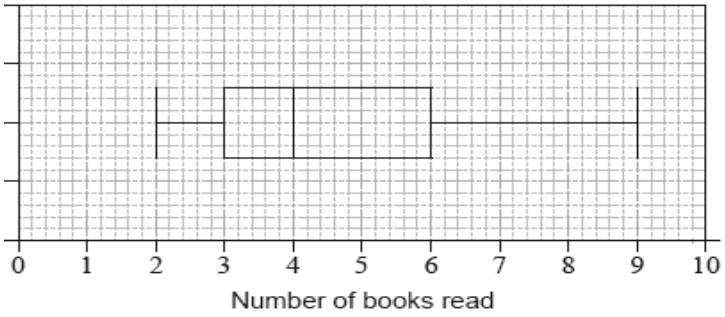
The quartiles for these results are 3 and 5.

Write down the value of the median for these results. *[1 mark]*

8b. Draw a box-and-whisker diagram for these results on the following grid. *[3 marks]*



8c. The results for **the second group** of 40 students are shown in the following box-and-whisker diagram.



Estimate the number of students **in the second group** who have read at least 6 books. *[2 marks]*

9a. *[1 mark]*

A class of 13 Mathematics students received the following grades in their final IB examination.

3 5 3 4 7 3 2 7 5 6 5 3 4

For these grades, find the mode;

. . . . . .
. . . . . .
. . . . . .

9b. *[2 marks]*

For these grades, find the median;

. . . . . .
. . . . . .
. . . . . .

9c. *[1 mark]*

For these grades, find the upper quartile;

. . . . . .
. . . . . .
. . . . . .

9d. *[2 marks]*

For these grades, find the interquartile range.

. . . . . .
. . . . . .
. . . . . .