SPECIAL MEETING NO. 1 and 2: "STATISTICS"

23 & 26 March 2020

Activity 1

[Maximum mark: 6]

A school conducts a research into how many minutes each day their students spend browsing the internet. Jake's class is studied first. The number of minutes spent browsing the internet by each student in Jake's class is shown in the following stem and leaf plot.

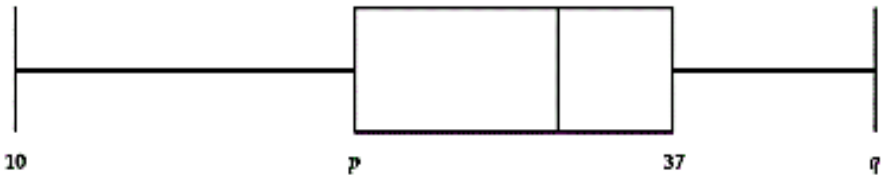
Stem	Leaf
1	0, 4, 8
2	3, 5, 8, 9
3	1, 3, 3, 6, 6, 8
4	0, 4, 5

Key: 2|3 represents 23 minutes

(a) (i) Write down the number of students in Jake's class.

(ii) Find the median number of minutes spent browsing the internet. [3]

The following box-and-whisker plot also displays the number of minutes spent browsing the internet by students in Jake's class.



(b) (i) Write down the value of q.

(ii) The interquartile range is 13. Find the value of p. [3]

Activity 2

The data of the goals scored by players in a futsal club during the winter games are given in the following table.

Goals	0	2	3	5	7	11	13
Frequency	2	3	6	k	3	2	1

(a) Given that the mean number of goals scored per player is 4.8, find the value of k. [3]

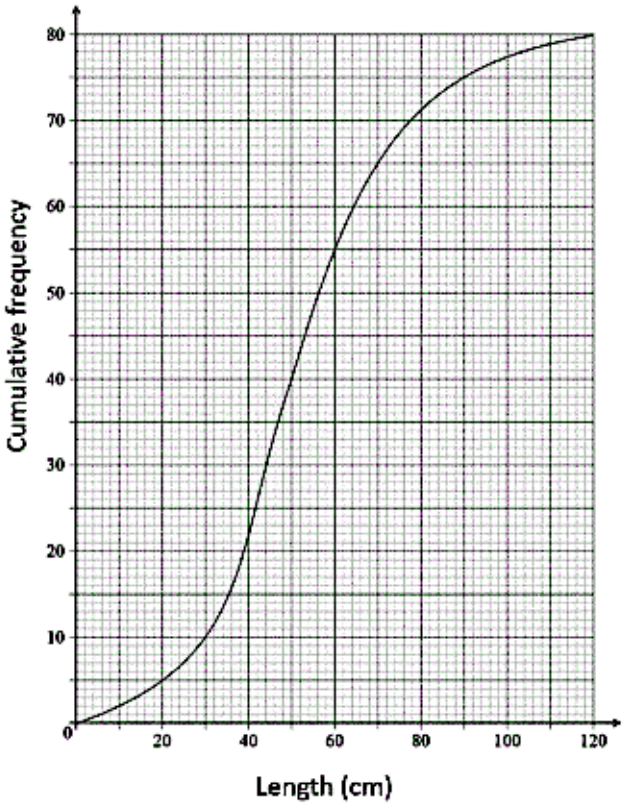
It is discovered that there is a mistake in the data and that two players, who scored 2 and 13 goals, have not been included in the table.

(b) (i) Find the correct mean number of goals scored per player.

(ii) Find the correct standard deviation of the numbers of goals scored per player. [3]

Activity 3

The length of 80 flower stems in a garden are shown in the following cumulative frequency diagram.



(a) (i) Write down the median length.

(ii) What percentage of flower stems are 60 cm or greater? [4]

The same data is presented in the following table.

Length x cm	$0 \leq l \leq 30$	$30 < l \leq 60$	$60 < l \leq 90$	$90 < l \leq 120$
Frequency	10	p	20	q

(b) (i) Find the value of p.

(ii) Find the value of q. [4]

(c) Use the values from the table to estimate the mean and standard deviation of the lengths. [3]

Flower stems that are 60 cm or greater in length are considered mature flowers.

(d) Given that a randomly selected flower is mature, find the probability its stem is 90 cm or greater in length. [4]

MARK SCHEME

1.

A school conducts a research into how many minutes each day their students spend browsing the internet. Jake's class is studied first. The number of minutes spent browsing the internet by each student in Jake's class is shown in the following stem and leaf plot.

Stem	Leaf	Key: 2|3 represents 23 minutes
1	0, 4, 8	
2	3, 5, 8, 9	
3	1, 3, 3, 6, 6, 8	
4	0, 4, 5	

Med: 8.5th student
$p^{th} = 31$
$q^{th} = 33$

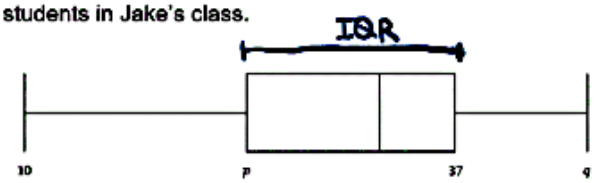
a) (i) $n = 16$

(ii) Med = 32 min

(a) (i) Write down the number of students in Jake's class.

(ii) Find the median number of minutes spent browsing the internet. [3]

The following box-and-whisker plot also displays the number of minutes spent browsing the internet by students in Jake's class.



b) (i) q (max) = 45

(ii) $p = 37 - 13$

$\therefore p = 24$

(b) (i) Write down the value of q.

(ii) The interquartile range is 13. Find the value of p. [3]

2.

(a) Solving the following equation for the missing frequency k, we get

$$\begin{aligned} \frac{0 \cdot 2 + 2 \cdot 3 + 3 \cdot 6 + 5 \cdot k + 7 \cdot 3 + 11 \cdot 2 + 13 \cdot 1}{17 + k} &= 4.8 \\ \frac{80 + 5k}{17 + k} &= \frac{24}{5} \\ 400 + 25k &= 408 + 24k \\ k &= 8. \end{aligned}$$

(b) (i) The correct mean number of goals scored per player is

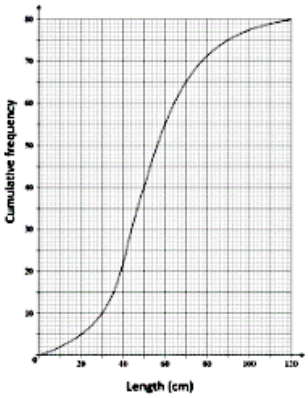
$$\begin{aligned} \bar{x} &= \frac{80 + 5 \cdot 8 + 2 + 13}{17 + 8 + 2} \\ &= \frac{135}{27} \\ &= 5. \end{aligned}$$

(ii) The correct standard deviation of the numbers of goals scored per player is

$$\sigma \approx 3.45 \qquad \text{[by using G.D.C.]}$$

3.

The length of 80 flower stems in a garden are shown in the following cumulative frequency diagram.



(a) (i) Write down the median length.

(ii) What percentage of flower stems are 60 cm or greater? [4]

a) (i) median = 50 cm

(ii) $\frac{25}{80} \Rightarrow$ 31.25 %

The same data is presented in the following table.

midpoints

	15	45	75	105
Length x cm	$0 \le l \le 30$	$30 < l \le 60$	$60 < l \le 90$	$90 < l \le 120$
Frequency	10	p	20	q

(b) (i) Find the value of p. $p = 45$

(ii) Find the value of q. $q = 5$ [4]

(c) Use the values from the table to estimate the mean and standard deviation of the lengths. [3]

Flower stems that are 60 cm or greater in length are considered mature flowers.

(d) Given that a randomly selected flower is mature, find the probability its stem is 90 cm or greater in length. [4]

c) using G.C

$\bar{x} = 52.5$ cm

$\sigma = 22.5$ cm

d) $P(x > 90 \mid x > 60)$

$\frac{P(x > 90)}{P(x > 60)} = \frac{5/80}{25/80}$

$\frac{5}{25} = \frac{1}{5}$