AQA - Measure of Location and spread – GCSE Statistics – 2019

1. June/2019/Paper_1F/No.3

For the numbers

3 3 6

circle the measure that has a **different value** to the others.

[1 mark]

range mode median mean

2. June/2019/Paper_1F/No.15(e-h)

(e) Charlie decides to look into rail travel in more depth.

She asks 12 of her friends how many times they have been on a train in the last year.

The results, in ascending order, are

0 0 0 0 0 1 1 2 4 6 7 387

Charlie says,

"The average number of times my friends have been on a train in the last year is 34"

(e) (i) Which measure of average did Charlie work out?

Show working to support your answer.

[2 marks]

Answer _____

(e) (ii) Comment on the use of this measure of average in this context.

[1 mark]

(e) (iii) Discuss the suitability of **two** other measures of average Charlie could use.

Suggest which would be the best measure of average to use.

[3 marks]

(f) Name **one** piece of primary data used in Charlie's investigation.

[1 mark]

(g) Name **one** piece of secondary data used in Charlie's investigation.

[1 mark]

_____

_____

(h) Give **one** way that Charlie could have improved the data collection at any point in her investigation.

[1 mark]

_____

_____

3. June/2019/Paper_1H/No.8(e-h)

(e) Charlie decides to look into rail travel in more depth.

She asks 12 of her friends how many times they have been on a train in the last year.

The results, in ascending order, are

0 0 0 0 0 1 1 2 4 6 7 387

Charlie says,

"The average number of times my friends have been on a train in the last year is 34"

(e) (i) Which measure of average did Charlie work out?

Show working to support your answer.

[2 marks]

Answer _____

(e) (ii) Comment on the use of this measure of average in this context.

[1 mark]

(e) (iii) Discuss the suitability of **two** other measures of average Charlie could use.

Suggest which would be the best measure of average to use.

[3 marks]

(f) Name **one** piece of primary data used in Charlie's investigation.

[1 mark]

(g) Name **one** piece of secondary data used in Charlie's investigation.

[1 mark]

(h) Give **one** way that Charlie could have improved the data collection at any point in her investigation.

[1 mark]

4. June/2019/Paper_1H/No.16

The tibia is the bone that connects the knee to the ankle bone.

The lengths of tibia bones in **modern-day** adult males have a normal distribution with mean 36.0 cm and standard deviation 2.8 cm.

(a) **Almost all** adult male tibia bones have lengths that are between a cm and b cm.

Calculate the values of a and b

[3 marks]

a = _____

b = _____

(b) The lengths of tibia bones in **modern-day** adult **females** have a normal distribution with mean 33.8 cm and standard deviation 2.2 cm.

(b) (i) A tibia bone is discovered measuring 34.5 cm.

Alice says the bone is more likely to be from an adult female than an adult male.

Evaluate Alice's statement.

$$\text{Use standardised score} = \frac{\text{value} - \text{mean}}{\text{standard deviation}}$$

[3 marks]

(b) (ii) In fact, the bone in **part (b)(i)** was discovered on an old Roman site and is estimated as being about 1900 years old.

Is the conclusion made in **part (b)(i)** likely to be valid?

Explain your answer.

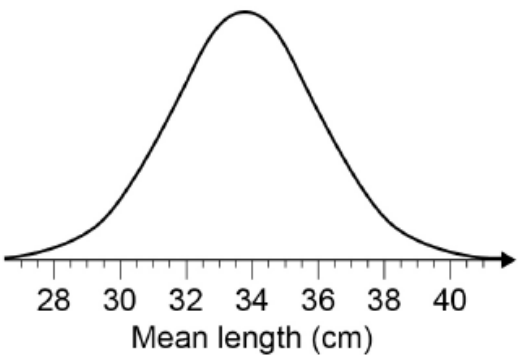
[1 mark]

(c) A number of samples of tibia length for modern-day adult **females** were collected.

A histogram is drawn to represent the **mean values** of these samples.

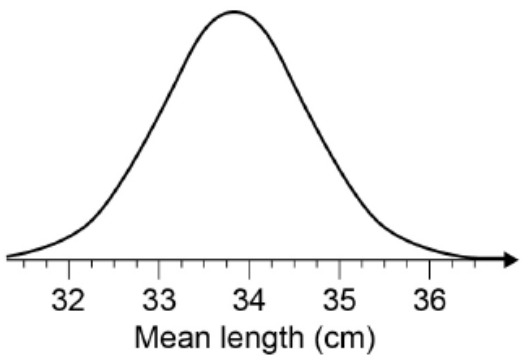
Which normal distribution curve should the histogram most look like?

A



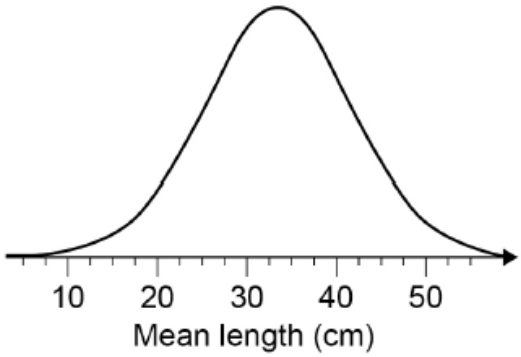
mean = 33.8 cm s.d. = 2.2 cm

B



mean = 33.8 cm s.d. < 2.2 cm

C



mean = 33.8 cm s.d. > 2.2 cm

Circle your answer.

[1 mark]

A B C

5. June/2019/Paper_2H/No.1

A set of data has

mean = 30

median = 25

standard deviation = 4

Circle the value of the skew for the data.

Use skew = $\frac{3\ (\text{mean} - \text{median})}{\text{standard deviation}}$

[1 mark]

−11.25 1.25 3.75 16.25

6. June/2019/Paper_2H/No.3

A gym has 800 members.

Lara asks a random sample of 40 members how many times they used the swimming pool last week.

Here are her results.

Number of times	0	1	2	3 or more
Frequency	21	10	5	4

Use Lara's results to estimate the total number of gym members who used the swimming pool **3 or more** times last week.

Circle your answer.

[1 mark]

4 80 160 200

7. June/2019/Paper_2H/No.4

Tina uses four online tests to measure her reaction time.

She measures her reaction times 20 times using each of the four tests.

The mean and standard deviation (s.d) of her results from each test are shown.

	Test A	**Test B**	**Test C**	**Test D**
mean (seconds)	0.415	0.583	0.379	0.375
s.d. (seconds)	0.025	0.054	0.104	0.075

Circle the test that appears to give the most **reliable** measure of Tina's reaction time.

[1 mark]

Test A Test B Test C Test D

8. June/2019/Paper_2H/No.11

(a) Here are the volumes, in cm^3, of 11 small containers.

15 16 19 21 25 26 28 29 31 34 37

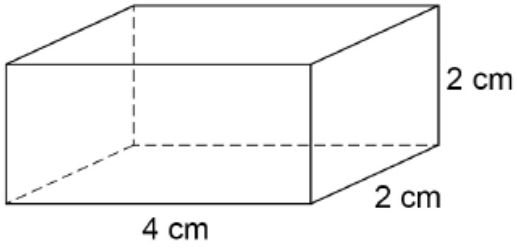
Circle the value, in cm^3, of the interquartile range.

[1 mark]

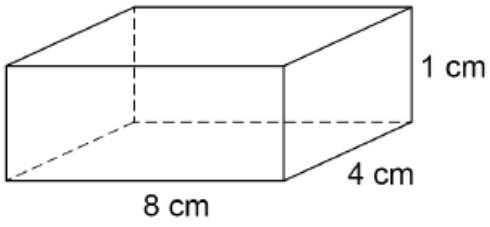
6 12 22 25

(b) Here are four cuboids.

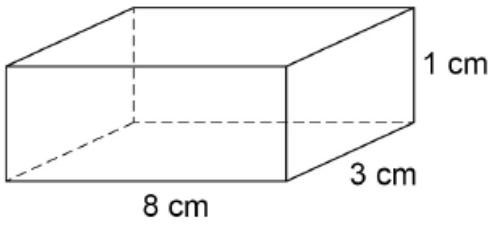
A



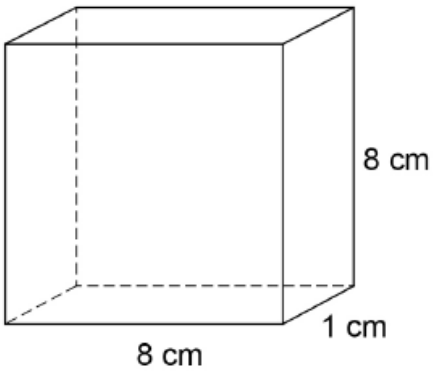
B



C



D



The geometric mean of the three side lengths of one of the cuboids is 4 cm

Circle the letter of this cuboid.

[1 mark]

A B C D

9. June/2019/Paper_2H/No.14

Carly has an activity tracker watch which tells her the distance she walks each day.

She sets herself the following target,

Target: Walk at least 6 km **every** day.

(a) She records the distance, x km, she walks on each of 24 different days.

Here is a summary of her results.

$$\sum x = 149.76 \qquad \sum x^2 = 968.72$$

(a) (i) Show that the mean distance she walks each day is 6.24 km

[1 mark]

(a) (ii) Show that the standard deviation is 1.2 km to 1 decimal place.

Use standard deviation = $\sqrt{\frac{\sum x^2}{n} - \left(\frac{\sum x}{n}\right)^2}$

[2 marks]

(a) (iii) Carly says that she has met her target.

Comment on Carly's claim.

Explain your answer.

[2 marks]

(b) Tomasz and Erika also have activity tracker watches.

The mean and the standard deviation for the distance they walk each day are shown in the table.

	Mean (km)	Standard deviation (km)
Tomasz	5.15	2.34
Erika	5.36	0.45

Compare statistically the distances walked by Tomasz and Erika.

[2 marks]