SQA Past paper questions

FORMULAE LIST

Standard deviation:

$$s = \sqrt{\frac{\Sigma(x-\bar{x})^2}{n-1}}$$

2024 - Paper 1 - Question 5

The prices, in pounds (£), of the cameras on display in a shop are listed below.

155 160 190 210 230 240

(a) Calculate the median and the interquartile range of these prices. **3**

On a website, a sample of camera prices have a median of £195 and an interquartile range of £73.

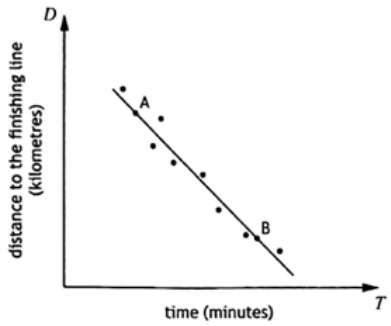
(b) Make two valid comments comparing the prices of the cameras in the shop and on the website. **2**

Click here for video solution.

2024 - Paper 1 - Question 9

In a car rally, competitors start at different times.

The scattergraph shows the relationship between the length of time they have been driving, T minutes, and the distance to the finishing line, D kilometres.



A line of best fit has been drawn.

Point A represents a competitor who has been driving for 3 minutes and is 26 kilometres from the finishing line.

Point B represents a competitor who has been driving for 10 minutes and is 12 kilometres from the finishing line.

(a) Find the equation of the line of best fit in terms of D and T.
Give the equation in its simplest form. **3**

Another competitor has been driving for 7 minutes.

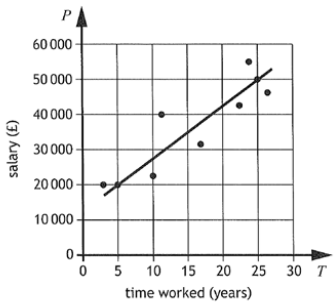
(b) Use your equation from part (a) to estimate the distance the competitor is from the finishing line. **1**

Click here for video solution.

2023 - Paper 1 - Question 7

A business recorded the salaries of a sample of its employees and the length of time they have worked for the business.

The scattergraph shows the relationship between their salary, P pounds, and the length of time, T years, they have worked.



A line of the best fit has been drawn.

(a) Find the equation of the line of best fit in terms of P and T.
Give the equation in its simplest form. **3**

(b) Use your equation from part (a) to estimate the salary of an employee who has worked for the business for 8 years. **1**

Click here for video solution.

2023 - Paper 1 - Question 9

A magazine company conducted a survey of the ages of its readers.

A sample of ten readers' ages, in years, are shown below.

33 55 38 47 36 41 42 41 35 31

(a) Calculate the median and interquartile range of the ages of readers for this sample. **3**

A newspaper company also conducted a survey of the ages of its readers.

The median age of a sample of its readers was 41 years and the interquartile range was 9 years.

(b) Make two valid comments comparing the ages of the readers of the magazine and the ages of the readers of the newspaper. **2**

Click here for video solution.

2022 - Paper 2 - Question 5

A school netball team recorded the number of sit-ups each player completed in a minute.

The numbers for the seven players were:

29 27 24 31 22 19 30

(a) Calculate the mean and standard deviation of the numbers of sit-ups. **4**

Some players in the school's hockey team also recorded the number of sit-ups they completed in a minute.

Their numbers gave a mean of 29 and a standard deviation of 3·2.

(b) Make two valid comments comparing the number of sit-ups of the players in the netball team and the hockey team. **2**

Click here for video solution.

2021 - Paper 1 - Question 5

The number of absentees at Applegrove High School was recorded each day over a four-week period.

The results are shown below.

7	8	8	11	12	14	14	15	17	17
18	20	20	21	23	24	25	26	27	29

Find the semi-interquartile range of this data. **2**

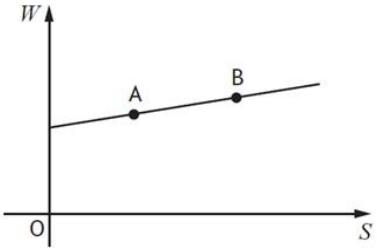
Click here for video solution.

2021 - Paper 1 - Question 10

David works in a shop, and is paid weekly.

His wage is made up of a basic wage plus commission on his sales.

The graph shows his wage, W pounds, against his sales, S pounds.



Point A represents sales of £6000 and a wage of £450.

Point B represents sales of £7200 and a wage of £510.

(a) Find the equation of the line in terms of W and S.
Give the equation in its simplest form. **3**

(b) Calculate David's wage in a week when his sales are £1000. **1**

Click here for video solution.

2021 - Paper 2 - Question 6

A company operates a bus route from the city centre to the airport.

The number of passengers on six of its buses on a Monday was

32 27 34 29 31 33.

(a) Calculate the mean and standard deviation of the number of passengers. **4**

(b) The mean number of passengers the following Saturday was 28 and the standard deviation was 3·2.
Make two valid comments comparing the number of passengers on each bus on Monday and Saturday. **2**

Click here for video solution.

2019 - Paper 1 - Question 5

The midday temperatures in Grantford were recorded over a nine day period.
The temperatures, in °C, were

4 7 4 3 6 10 9 5 3

(a) Calculate the median and semi-interquartile range for these temperatures. **3**

Over the same nine day period the midday temperatures in Endoch were also recorded.
The median temperature was 8 °C, and the semi-interquartile range was 1·5 °C.

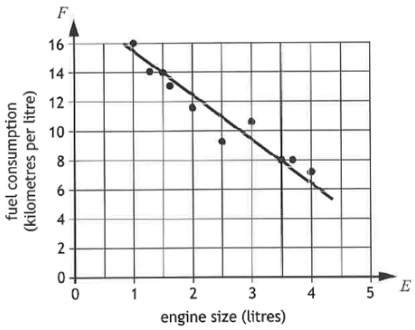
(b) Make two valid comments comparing the midday temperatures of Grantford and Endoch during this period. **2**

Click here for video solution.

2019 - Paper 1 - Question 6

The fuel consumption of a group of cars is recorded.

The scattergraph shows the relationship between the fuel consumption, F kilometres per litre, and the engine size, E litres, of the cars.



A line of best fit has been drawn.

(a) Find the equation of the line of best fit in terms of F and E.
Give the equation in its simplest form. **3**

Amaar's car has an engine size of 1·1 litres.

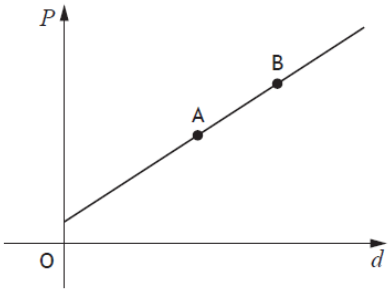
(b) Use your equation from part (a) to estimate how many kilometres per litre he should expect to get. **1**

Click here for video solution.

2018 - Paper 1 - Question 7

The cost of a journey with Tom's Taxis depends on the distance travelled.

The graph below shows the cost, P pounds, of a journey with Tom's Taxis against the distance travelled, d miles.



Point A represents a journey of 8 miles which costs £14.
Point B represents a journey of 12 miles which costs £20.

(a) Find the equation of the line in terms of P and d.
Give the equation in its simplest form. **3**

(b) Calculate the cost of a journey of 5 miles. **1**

Click here for video solution.

2018 - Paper 2 - Question 5

A farmers' market took place one weekend.

Stallholders were asked to record the number of customers who visited their stall.

The number of customers who visited six of the stalls on Saturday were as follows:

120 126 125 131 130 124

(a) Calculate the mean and standard deviation of the number of customers. 4

The mean number of customers who visited these six stalls on Sunday was 117 and the standard deviation was 6·2.

(b) Make two valid comments comparing the number of customers who visited these stalls on Saturday and Sunday. 2

Click here for video solution.

2017 - Paper 1 - Question 2

The number of calls received by the police was recorded over 10 days.

The results are shown below.

198 216 218 230 232 247 248 250 265 267

Find the semi-interquartile range of this data. 2

Click here for video solution.

2017 - Paper 1 - Question 12

Gym members are asked to fill out a questionnaire to rate the quality of service provided.

They are asked to give a rating on a scale of 1 to 6.

The ratings given by five members were as follows:

1 4 6 3 6

In its simplest form, the standard deviation of these ratings can be written as $\frac{a\sqrt{b}}{2}$.

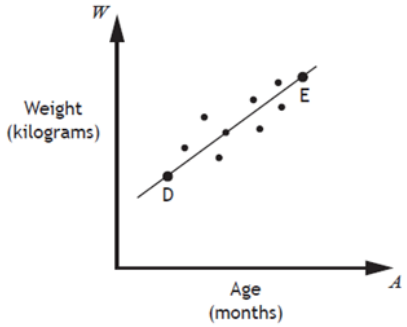
Find the values of a and b. 4

Click here for video solution.

2016 - Paper 1 - Question 5

A cattle farmer records the weight of some of his calves.

The scattergraph shows the relationship between the age, A months, and the weight, W kilograms, of the calves.



A line of best fit is drawn.

Point D represents a 3 month old calf which weighs 100 kilograms.

Point E represents a 15 month old calf which weighs 340 kilograms.

(a) Find the equation of the line of best fit in terms of A and W. 3

Give the equation in its simplest form.

(b) Use your equation from part (a) to estimate the weight of a one year old calf. 1

Show your working.

Click here for video solution.

2016 - Paper 2 - Question 6

Jack called his internet provider on six occasions to report connection problems.

On each occasion he noted the length of time he had to wait before speaking to an adviser.

The times (in minutes) were as follows:

13 16 10 22 5 12

(a) Calculate the mean and standard deviation of these times. 4

(b) Sophie also called the same internet provider, on several occasions, to report connection problems.

Her mean waiting time was 15 minutes and the standard deviation was 4·3 minutes.

Make two valid comments comparing Sophie's waiting times with Jack's waiting times. 2

Click here for video solution.

2015 - Paper 1 - Question 10

Ten couples took part in a dance competition.

The couples were given a score in each round.

The scores in the first round were

16 27 12 18 26 21 27 22 18 17

(a) Calculate the median and semi-interquartile range of these scores. 3

(b) In the second round, the median was 26 and the semi-interquartile range was 2·5.

Make two valid comparisons between the scores in the first and second rounds. 2

Click here for video solution.

2015 - Paper 1 - Question 5

The standard deviation of 1, 2, 2, 2, 8 is equal to $\sqrt{a}$.

Find the value of a. 3

Click here for video solution.

2014 - Paper 1 - Question 6

McGregor's Burgers sells fast food.

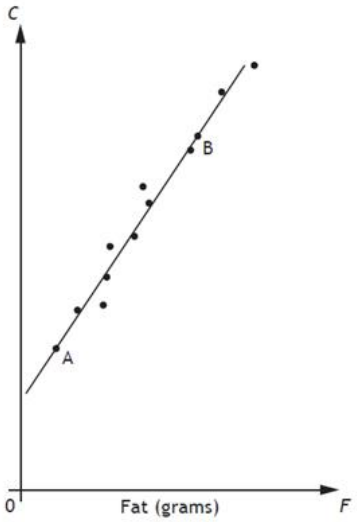
The graph shows the relationship between the amount of fat, F grams, and the number of calories, C, in some of their sandwiches.

A line of best fit has been drawn.

Point A represents a sandwich which has 5 grams of fat and 200 calories.

Point B represents a sandwich which has 25 grams of fat and 500 calories.

(a) Find the equation of the line of best fit in terms of F and C. 3



Calories

(b) A Super Deluxe sandwich contains 40 grams of fat.

Use your answer to part (a) to estimate the number of calories this sandwich contains.

Show your working. 1

Click here for video solution.

2014 - Paper 2 - Question 4

A runner has recorded her times, in seconds, for six different laps of a running track.

53 57 58 60 55 56

(a) (i) Calculate the mean of these lap times.
Show clearly all your working. 1

(ii) Calculate the standard deviation of these lap times.
Show clearly all your working. 3

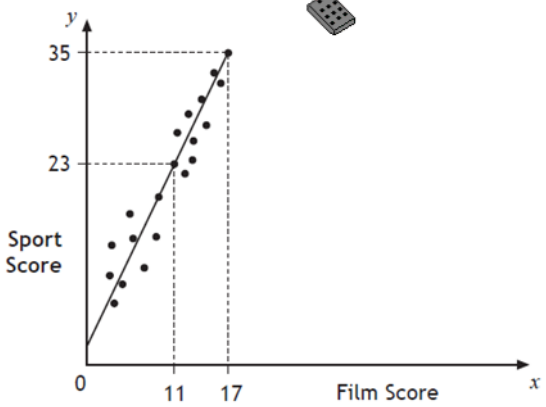
(b) She changes her training routine hoping to improve her consistency.
After this change, she records her times for another six laps.
The mean is 55 seconds and the standard deviation 3·2 seconds.
Has the new training routine improved her consistency?
Give a reason for your answer. 1

Click here for video solution.

Specimen - Paper 1 - Question 6

Teams in a quiz answer questions on film and sport.
This scattergraph shows the scores of some of the teams.

A line of best fit is drawn as shown.



(a) Find the equation of this straight line. 3

(b) Use this equation to estimate the sports score for a team with a film score of 8. 1

Click here for video solution.

Specimen - Paper 2 - Question 8

A frozen food company uses machines to pack sprouts into bags.

A sample of six bags is taken from Machine A and the number of sprouts in each bag is counted.

The results are shown below.

23 19 21 20 19 24

(a) Calculate the mean and standard deviation of this sample. **3**

(b) Another sample of six bags is taken from Machine B.

This sample has a mean of 19 and a standard deviation of 2·3.

Write down two valid comparisons between the samples. **2**

Click here for video solution.