

Functional Skills Maths

Level 1

Find mean and range

v1.0

Functional Skills Maths:

Level 1

Skill Standard:

13

Coverage and Range:

Find mean and range.

- Know that the mean is a single value that represents the data.
- Know that the mean is one sort of average that can give a distorted view if one or two values are much higher or lower than the other values, for example salaries.
- Calculate the mean by summing all the values then dividing by the number of items, for example temperature, prices, time.
- Understand that the range measures the spread of a data, for example temperatures.
- Understand that range is the difference between the minimum and maximum values in the set of data.¹

¹ QCA Functional Skills guidance: amplification of the standards June 2008 QCA/08/3700

Explain the Skill

Find the Mean Average

An average is a number that represents a set of data. The most commonly used average is the mean.

To find the mean of a list of numbers you need to:

add up all the numbers in the list and then
divide the answer by **how many** there are.

$$\text{Mean} = \frac{\text{total of all the values}}{\text{number of values}}$$

Find the mean of 5, 6, 10, 7, 12

Add up all the numbers: $5 + 6 + 10 + 7 + 12 = 40$

There are 5 numbers in the list, so divide the answer by 5

$$40 \div 5 = 8$$

The mean is 8

Practise the Skill

1) Find the mean of this set of values.

15 8 12 14 10 13

2) Find the mean age of this group of students.

18 20 19 23 27 19 21

- 3) These are the weights of the new born kittens at a rescue centre.

89 g 97 g 110 g 106 g 112 g

Which calculation gives the mean weight of the new born kittens?

Circle your answer.

$$\frac{5}{89 + 97 + 110 + 106 + 112}$$

$$\frac{89 + 97 + 110 + 106 + 112}{7}$$

$$\frac{89 + 97 + 110 + 106 + 112}{5}$$

- 4) The table below shows the number of hours of sunshine each day in Madrid for the months of February to October.

What is the mean number of daily hours of sunshine?

Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct
3	4	7	10	12	13	11	7	5

5) Beth goes shopping every week for six weeks.

What is the mean amount she spends per week?

Week 1	£37
Week 2	£41
Week 3	£29
Week 4	£55
Week 5	£46
Week 6	£23

£ _____

Explain the Skill

Mean – Distorted View

Sometimes the mean can give a 'distorted average' if one or two values are much higher or lower than the other values.

A small business pays its employees the following salaries.

1 Sales assistant	£17,000
1 Admin assistant	£15,000
1 Receptionist	£12,000
1 Cleaner	£9,000

What is the mean salary of the employees?

Add up all the salaries: $£17\,000 + £15\,000 + £12\,000 + £9\,000 = £53\,000$

There are 4 salaries in the list, so divide £53 000 by 4.

$$53\,000 \div 4 = £13\,250$$

So the mean of the employees' salaries is £13 250.

The manager has a salary of £36 000. What is the mean salary of the 5 employees?

The total of all the salaries = $£53\,000 + £36\,000 = £89\,000$

There are 5 salaries so $£89\,000 \div 5 = £17\,800$

The mean of all the salaries is £17 800, however, only the manager earns over this amount.

When the manager's salary is included the mean increases from £13 250 to £17 800, yet, all the other employees earn less than this amount.

Practise the Skill

1) The ages of the patients in a doctor's surgery are:

27 13 16 20 41 9

a) Find the mean of this set of data.

Another patient has just walked in and their age is 84.

b) What is the mean age of the patients now?

c) How many patients are now over this mean age?

- 2) This table shows the average house price for a detached house in different regions currently in the UK.

Region	Average House Prices <u>Detached House</u>
North	£236 319
West Midlands	£277 527
East Midlands	£241 026
South West	£325 861
Wales	£226 468
Scotland	£257 119

- a) What is the mean house price?

£ _____

The mean price for a detached house in Greater London is £718 828.

- b) What is the mean price when the average house price in Greater London is included?

£ _____

- c) In how many **other** regions is the average house price above this mean value?

Explain the Skill

Finding the Range

The range of a set of data tells you how widely the numbers are spread.

To find the range of a set of values you subtract the smallest value from the largest value.

Find the range of the following: 48 15 23 12 34

The **largest** value is 48 and the **smallest** value is 12

Take the smallest value from the largest value: $48 - 12 = 36$

The range is 36.

Practise the Skill

1) Find the range of these sets of data.

a) 28 18 36 30 15 9

b) 270 g 860 g 607 g 350 g 720 g 207 g

_____ g

c) £5.60 £6.10 £3.60 £4.50 £9.40 £6.90

£ _____

d) 22 °C 19 °C 5 °C 15 °C 24 °C 13 °C

_____ °C

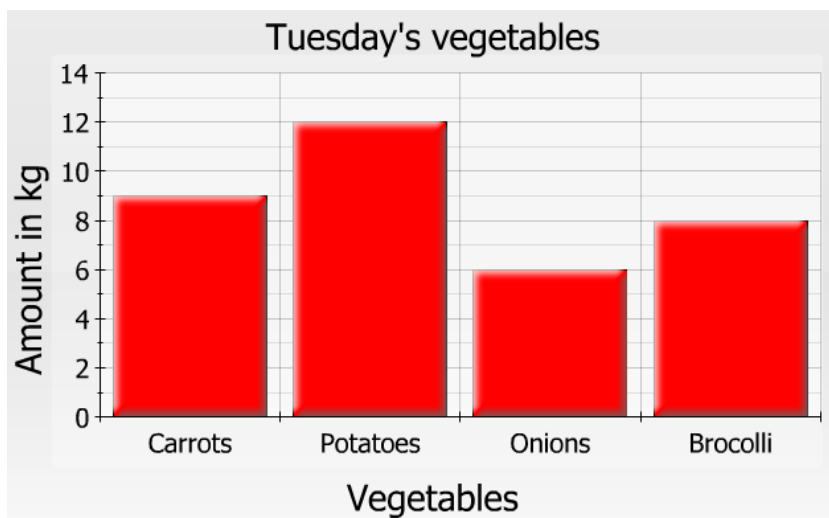
2) James records the temperature in his greenhouse over a week.

12 °C 13 °C 11 °C 0 °C 6 °C 4 °C 2 °C

What is the range in the temperature?

_____ °C

3) Use the graph to answer the question below.



What is the range of the vegetables' weights in kilograms?

_____ kg

4)

Variety of Apple	Bag of Apples			
	<i>Ted's Discount</i>	<i>Cheapos</i>	Good Buy's	<i>Bargain Bill</i>
Jala	£2.50	£1.70	£1.95	£2.00
Golden	£1.85	£2.00	£1.80	£1.95
Juicy	£1.50	£1.80	£2.00	£1.65

a) What is the price range for **each variety** of apple?

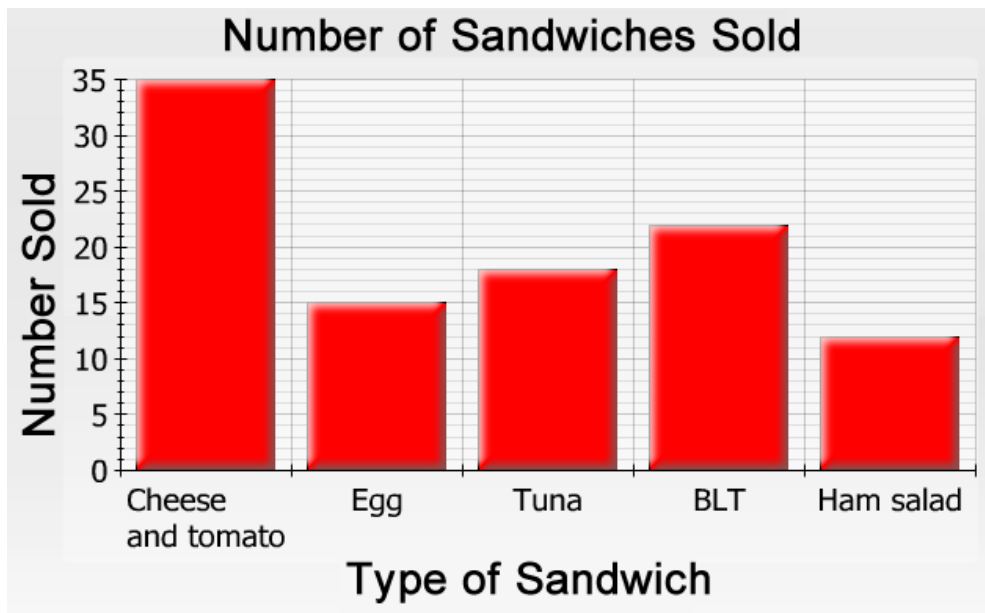
Jala _____ p

Golden _____ p

Juicy _____ p

b) Which variety of apple has the most consistent price?

- 5) Use the graph to answer the question below.



What is the range of the number of sandwiches sold?

Apply the Skill


- 1) Jan is a member of her local theatre group and they are putting on their annual outdoor production.

The table shows the ticket sales for the evening and matinee performances.

Show	Wed	Thurs	Fri	Sat	Sun
Matinee				251	183
Evening	149	185	281	360	275

What was the mean number of tickets sold for evening performances?






- 2) These are the prices for the tickets.

	Show	Ticket Prices	Ticket (+drink)
	Matinee performance	£11.75	£13.75
	Evening performance Wed/Thu/Sun	£13.50	£19.50
	Evening Performance Fri/Sat	£16.00	£21.50

What is the range in the price of tickets?

£ _____

3) Jan checks the weather forecast.

Day	Weather	Temp °C
Wed		19
Thu		21
Fri		??
Sat		23
Sun		22

She works out that the mean temperature from Wednesday to Sunday is 21 °C.

a) What is the temperature on Friday?

_____ °C

Jan's daughter sells 600 programs during the 5 performances.

b) On average, how many programs did she sell per performance?

She serves the drinks at the interval. She serves 40 drinks in 20 minutes.

c) What is the mean time she takes to serve 1 drink?

_____ seconds

4) When the production has finished the theatre group receive several donations.

£250

£25

£40

£35

£65

a) What is the range in the amounts donated?

£ _____

b) What is the mean amount donated?

£ _____

A local print company then makes a donation and the treasurer calculates the new mean value to be £102.50.

c) How much did the print company donate?

£ _____