Data collection, averages and range

List the 3 types of averages and how to calculate them below:

M.............
M.............
M.............

What is the range?

1. Find the mean, median, mode and range of shoe sizes of students in the room today. *Show your working!*

   Mean:

   Median:

   Mode:

   Range:

2. What is the mean age and range of ages of students in the group? *Show your working!*

   Mean:

   Range:

3. Now work out what the mean and range are *including* your lecturer’s age.

   Mean:

   Range:

   What has happened to the mean and range now your lecturer is included?
Data collection, averages and range

Name ____________________  Date ________

Now you are going to work out the mean head size of students in the class – let’s see who has the biggest brain!

In pairs, measure each other’s head circumference.

In each box list the name of the student and the size of their head in centimetres (to one decimal place).

<table>
<thead>
<tr>
<th>Name</th>
<th>Head Size (cm)</th>
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</thead>
<tbody>
<tr>
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</tbody>
</table>

Who has the biggest head and how big is it?

Convert it to mm.

Who has the smallest head and how big is it?

Convert it to mm.

What is the range of head sizes in mm?

What is the mean head size in cm?

What is the median head size in cm?

Is there a modal head size?
Geoff is a multi-tradesman.

He has been told by the local builders’ merchant that if he spends an average of £1000 per month over a 12 month period, then they will give him a reward account card. This rewards cards allows him to have a 2% discount off monthly totals over £1000 spend or 5% off spends above £2000.

The table below shows how much Geoff spent in 2012.

<p>| | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Jan</td>
<td>Feb</td>
<td>March</td>
<td>April</td>
<td>May</td>
<td>June</td>
</tr>
<tr>
<td>£875.89</td>
<td>£917.52</td>
<td>£1007.85</td>
<td>£2158</td>
<td>£1103.57</td>
<td>£1012.50</td>
</tr>
<tr>
<td>July</td>
<td>Aug</td>
<td>Sep</td>
<td>Oct</td>
<td>Nov</td>
<td>Dec</td>
</tr>
<tr>
<td>£1000.02</td>
<td>£506</td>
<td>£905.78</td>
<td>£1010.12</td>
<td>£974.58</td>
<td>£751.29</td>
</tr>
</tbody>
</table>

1. What is the range of Geoff’s spending?

2. In which month does he spend the least? Why do you think that is?

3. Does Geoff qualify for a reward account card? **Show your working!**

4. Calculate the savings Geoff could have made each qualifying month if he had been given a reward account card for 2012.

What is the **total** amount he could have saved?
# Data collection, averages and range

**Functional Maths mapping and answers**

<table>
<thead>
<tr>
<th>FUNCTIONAL MATHEMATICS Coverage and Range statements (indicative only)</th>
</tr>
</thead>
<tbody>
<tr>
<td>This resource is ideal for underpinning many Functional Maths coverage and range statements at Level 1 and Level 2 (see highlighted areas of the table below). Coverage and range statements provide an indication of the type of mathematical content candidates are expected to apply in functional contexts. Relevant content can also be drawn from equivalent National Curriculum levels &amp; Adult Numeracy standards. However, in Functional Maths exams it is the process skills that are assessed; these are key to successful Functional Maths teaching and learning and must always be developed and stressed during teaching (see below). Ofqual (2009), <em>Functional Skills criteria for Mathematics: Entry 1, Entry 2, Entry 3, level 1 and level 2</em>, <a href="http://www.ofqual.gov.uk/">http://www.ofqual.gov.uk/</a>.</td>
</tr>
</tbody>
</table>

### Level 2

- **a)** understand and use positive and negative numbers of any size in practical contexts
- **b)** carry out calculations with numbers of any size in practical contexts, to a given number of decimal places
- **c)** understand, use and calculate ratio and proportion, including problems involving scale
- **d)** understand and use equivalences between fractions, decimals and percentages
- **e)** understand and use simple formulae and equations involving one or two operations
- **f)** recognise and use 2D representations of 3D objects
- **g)** find area, perimeter and volume of common shapes
- **h)** use, convert and calculate using metric and, where appropriate, imperial measures
- **i)** collect and represent discrete and continuous data, using information and communication technology (ICT) where appropriate
- **j)** use and interpret statistical measures, tables and diagrams, for discrete and continuous data, using ICT where appropriate
- **k)** use statistical methods to investigate situations
- **l)** use probability to assess the likelihood of an outcome

### Level 1

- **a)** understand and use whole numbers and understand negative numbers in practical contexts
- **b)** add, subtract, multiply and divide whole numbers using a range of strategies
- **c)** understand and use equivalences between common fractions, decimals and percentages
- **d)** add and subtract decimals up to two decimal places
- **e)** solve simple problems involving ratio, where one number is a multiple of the other
- **f)** use simple formulae expressed in words for one or two-step operations
- **g)** use data to assess the likelihood of an outcome
- **h)** solve problems requiring calculation, with common measures, including money, time, length, weight, capacity & temperature
- **i)** convert units of measure in the same system
- **j)** work out areas and perimeters in practical situations
- **k)** construct geometric diagrams, models and shapes
- **l)** extract and interpret information from tables, diagrams, charts and graphs
- **m)** collect and record discrete data and organise and represent information in different ways
- **n)** find mean and range

### Process Skills (all levels)

<table>
<thead>
<tr>
<th>Representing – selecting the mathematics and information to model a situation</th>
<th>Analysing – processing and using mathematics</th>
<th>Interpreting – interpreting and communicating the results of the analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Skill Standards (Level 2)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• understand routine and non-routine problems in familiar and unfamiliar contexts and situations</td>
<td>• apply a range of mathematics to find solutions</td>
<td>• interpret and communicate solutions to multistage practical problems in familiar and unfamiliar contexts and situations</td>
</tr>
<tr>
<td>• identify the situation or problems and identify the mathematical methods needed to solve them</td>
<td>• use appropriate checking procedures and evaluate their effectiveness at each stage</td>
<td>• draw conclusions and provide mathematical justifications</td>
</tr>
<tr>
<td>• choose from a range of mathematics to find solutions</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Skill Standards (Level 1)

<table>
<thead>
<tr>
<th>Representing – selecting the mathematics and information to model a situation</th>
<th>Analysing – processing and using mathematics</th>
<th>Interpreting – interpreting and communicating the results of the analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Skill Standards (Level 1)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• understand practical problems in familiar and unfamiliar contexts and situations, some of which are non-routine</td>
<td>• apply mathematics in an organised way to find solutions to straightforward practical problems for different purposes</td>
<td>• interpret and communicate solutions to practical problems, drawing simple conclusions and giving explanations</td>
</tr>
<tr>
<td>• identify and obtain necessary information to tackle the problem</td>
<td>• use appropriate checking procedures at each stage</td>
<td></td>
</tr>
<tr>
<td>• select mathematics in an organised way to find solutions</td>
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<td></td>
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</tbody>
</table>
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Functional Maths mapping and answers

Answers:

Total amount: £12,223.12

Average (to 2dp) £1018.59

Yes he does qualify.

Savings:

March: £20.16
April: £107.90
May: £22.07
June: £20.25
July: £20.00
October: £20.20

TOTAL: £210.58