WJEC MATHEMATICS
INTERMEDIATE
STATISTICS AND PROBABILITY

PIE CHARTS

@MrGoreMaths.

www.mrgoremaths.co.uk
Contents

Interpreting Pie Charts
Drawing Pie Charts

Credits

WJEC Question bank
http://www.wjec.co.uk/question-bank/question-search.html
Interpreting Pie Charts
Pie charts are a way of representing data in a circle.

Angles as Fractions
Remember all the angles of the sectors of a pie chart sum to $360^\circ$. This means that if the angle to one 'slice' was $90^\circ$ we can write this as a fraction of the whole pie chart.

\[
\frac{90}{360} = \frac{1}{4}
\]

Similarly, if the entire pie chart contained 120 people and the angle of a specific sector was $36^\circ$ we can calculate how many people are contained in this sector

\[
\frac{36}{360} = \frac{1}{10}
\]

\[
\frac{1}{10} \text{ of } 120 = 12 \text{ people}
\]

Key point!
If you aren’t given the total of a pie chart you CANNOT compare them.

Example
The following pie chart shows 240 people's favourite ice cream flavour. How many said vanilla?

Using a protractor, this sector is $135^\circ$. So to calculate the fraction of this sector

\[
\frac{135}{360} = \frac{3}{8}
\]

Now find $\frac{3}{8} \text{ of } 240 = 90$

You should be able to recognise $90^\circ$ (one quarter)
Drawing Pie Charts
Here's a worked example of how to draw a pie chart from a frequency table

<table>
<thead>
<tr>
<th>Flavour</th>
<th>Number Sold (Frequency)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vanilla</td>
<td>13</td>
</tr>
<tr>
<td>Banana</td>
<td>22</td>
</tr>
<tr>
<td>Chocolate</td>
<td>28</td>
</tr>
<tr>
<td>Strawberry</td>
<td>57</td>
</tr>
</tbody>
</table>

Step 1
Add the total number of ice creams sold

$$13 + 22 + 28 + 57 = 120$$

Step 2
We know that the angles of all 120 ice creams must add to 360. To find the angle *per ice cream*

$$360 \div 120 = 3 \text{ (degrees)}$$

Step 3
Now that we know the angle of each ice cream we can calculate the angle of each section (flavour)

- Vanilla = $$13 \times 3 = 39^\circ$$
- Banana = $$22 \times 3 = 66^\circ$$
- Chocolate = $$28 \times 3 = 84^\circ$$
- Strawberry = $$57 \times 3 = 171^\circ$$

Check that these add up to 360

Draw with a pencil and protractor on angle at a time. If you finish and have not joined back up with the start, you have made a mistake.
Exam Questions S3

1. Clearly explain why the statements that accompany each of the following diagrams in a newspaper may not be true. Your comments should be based on the diagrams and not on your personal opinion.

(i) Taken from an item about left-handedness. [1]

\[ \text{Teenagers} \quad \text{Over 75 years old} \]

\[ \begin{array}{c}
\text{RIGHT} \\
\text{LEFT}
\end{array} \quad \begin{array}{c}
\text{RIGHT} \\
\text{LEFT}
\end{array} \]

‘There are twice as many left-handed teenagers as there are left-handed people over 75 years old.’

2. A number of people were asked to choose which of four brands of ice cream they liked the most. The brands were labelled A, B, C and D respectively.

Dimitar has begun to show the results using a pie chart.

\[ \begin{array}{c}
\text{B} \\
\text{A}
\end{array} \]

He knows that:

- 10 people chose brand A,
- 30 people chose brand C.

Calculate how many people chose brand D. [4]
3. A hospital collected data on the age group of each of 120 people that were treated as outpatients on a particular day.

The results are summarised below.

<table>
<thead>
<tr>
<th>Age group</th>
<th>Number of people</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-school</td>
<td>18</td>
</tr>
<tr>
<td>School</td>
<td>24</td>
</tr>
<tr>
<td>60 and over</td>
<td>35</td>
</tr>
<tr>
<td>Others</td>
<td>43</td>
</tr>
</tbody>
</table>

Draw a pie chart to illustrate these results.
You should show how you calculated the angles of your pie chart.
4. The table shows the number of ice creams of each of four flavours bought from a van one Saturday.

<table>
<thead>
<tr>
<th>Ice cream flavour</th>
<th>Vanilla</th>
<th>Chocolate</th>
<th>Strawberry</th>
<th>Raspberry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number bought</td>
<td>110</td>
<td>70</td>
<td>38</td>
<td>22</td>
</tr>
</tbody>
</table>

Draw a pie chart to illustrate this data. You should show how you calculate the angles of your pie chart.

5. The pie charts below represent the number of boys and the number of girls in two year groups.

There are 150 pupils in Year 7.
There are 40 more boys in Year 8 than there are boys in Year 7.

How many girls, in total, are there in Year 7 and Year 8?
6. Mrs Yusuf went shopping at a superstore.

The pie chart shows information about the money she spent on petrol, on clothes, on food and on other items.

(a) What did she spend most money on?

(b) What fraction of the money she spent was on petrol?

Mrs Yusuf spent £25 on petrol at the superstore.

(c) In total, how much money did she spend?

£ ................................. (2)

7. The pie chart shows some information about the time Gill spent working in her garden one month.

(a) What fraction of the time did Gill spend cutting the grass?

Gill spent 7 hours weeding.

(b) How much time did Gill spend planting?