

Pie Charts

Pie charts are based on fractions of a circle.

We use the angle in a pie chart to represent a value.

Example:

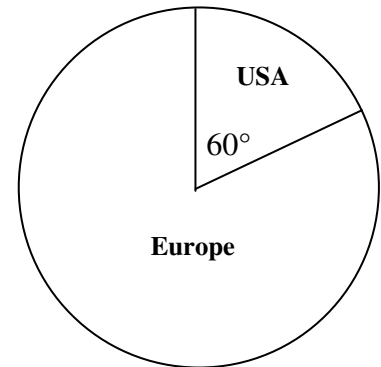
This pie chart shows holidays taken in the USA and holidays taken in Europe, in a survey of 600 travelers.

In this pie chart, the 60° sector represents holidays in the USA.

This sector is: $\frac{60}{360}$ of the whole circle i.e. $\frac{1}{6}$

and so this represents $\frac{1}{6}$ of the total survey

i.e. $\frac{1}{6}$ of 600 = 100 travellers.



Reading values from a pie chart.

Find the **angle** of the appropriate sector – it will be marked, or you may have to measure it.

Form the **fraction of 360°** that it represents;

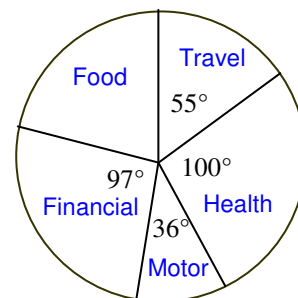
this is the **fraction of the whole** amount that the pie chart represents.

Example:

This pie chart shows workers in different industries.

The survey was of 2400 workers.

How many worked in the food industry ?



Solution:

First we need to calculate the angle of the food industry sector;

Add up the other angles: $55 + 100 + 36 + 97 = 288^\circ$

Subtract from 360°: $360 - 288 = 72^\circ$

The food sector is: $\frac{72}{360}$ of the total = $\frac{1}{5}$ and so $\frac{1}{5}$ of 2400 = 480 workers in food industry.

Calculating the angles in a pie chart.

To calculate the angle required in a pie chart:

1. Find the fraction that the sector is to represent. i.e. $\frac{\text{sector value}}{\text{total}}$
2. Calculate this fraction of the whole circle (360°). i.e. $\frac{\text{sector value}}{\text{total}} \times 360^\circ$

Example:

The following table shows holiday destinations from a survey of 1440 tourists.

What angles are required to show each destination on a pie chart.

Destination	No. of tourists
France	504
Spain	288
Portugal	216
Italy	360
Austria	72
TOTAL:	1440

Find the fraction of 14400 for each destination.

Destination	No. of tourists	Fraction of 360°	Angle
France	504	$\frac{504}{1440} \times 360$	126°
Spain	288	$\frac{288}{1440} \times 360$	72°
Portugal	216	$\frac{216}{1440} \times 360$	54°
Italy	360	$\frac{360}{1440} \times 360$	90°
Austria	72	$\frac{72}{1440} \times 360$	18°
TOTAL:	1440		360°

Check that the total of the angle column adds up to 360° .