

Displaying Data - Pie Charts

After completing this unit, you will be able to:

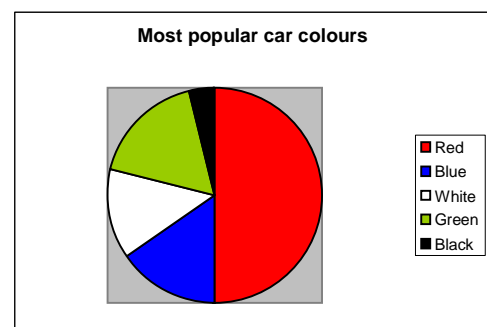
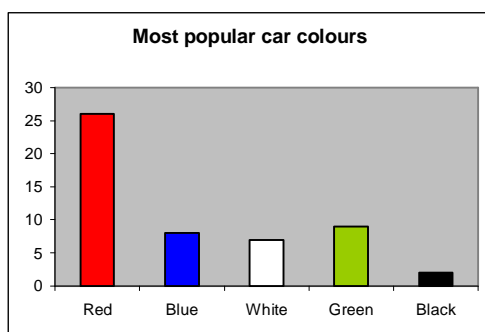
- Know when to use pie charts.
- Read and interpret information from a pie chart.
- Construct a pie chart.

Pie Charts

When to use

Pie charts are useful when you want to show the amount in a certain category in relation to the total amount

Eg The two illustrations below show the most popular colours of cars from a survey in a car park.
The bar chart shows clearly the number in each category, but the pie chart shows more clearly that one colour, in fact, accounted for half of those surveyed.

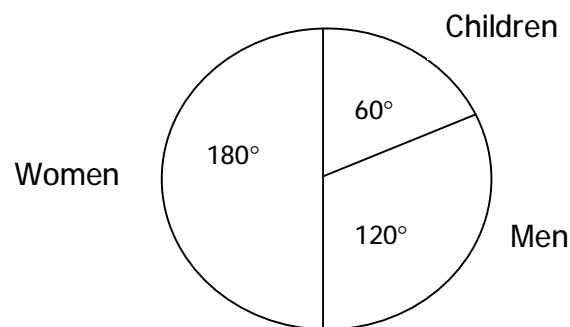


Reading a pie chart

A pie chart, then, shows the proportion, or fraction, of the total accounted for by each group.

As there are 360 degrees in the full circle you can measure the number of degrees for a sector and express it as a fraction, (as so many 360 ths).

e.g The diagram below shows the breakdown of spectators at an international hockey match.
 There were a total of 12,000 people attending the match.
 How many were there in each group ?



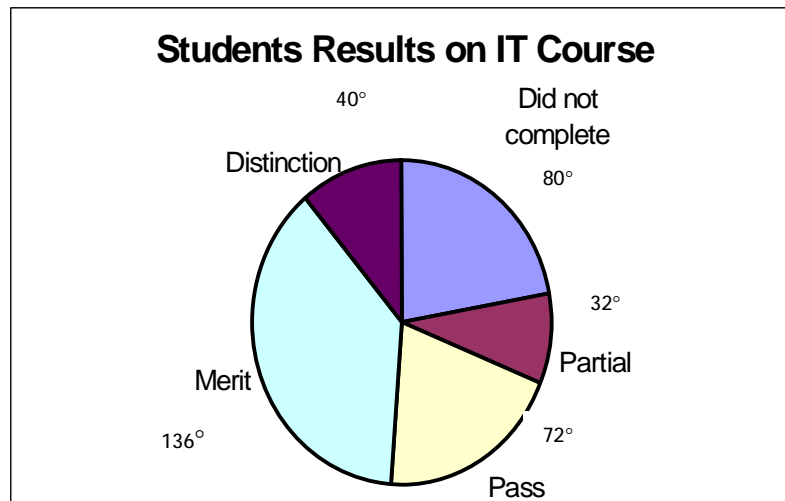
- You first need to know the number of degrees for each sector.
 You may have to measure this with a protractor, but in this case the angles are given.
- The sector for women accounts for 180° out of a total of 360°. So , as a fraction, it represents $\frac{180}{360}$ ths of the total.
- The total number of people was 12,000.
 So the number of women were $\frac{180}{360}$ ths of 12,000.
 This comes to 6,000

You can set this out in a table and complete it for each sector.
 Remember to check that the total number of degrees adds up to 360 and that the total number of people in each sector adds up to 12,000.

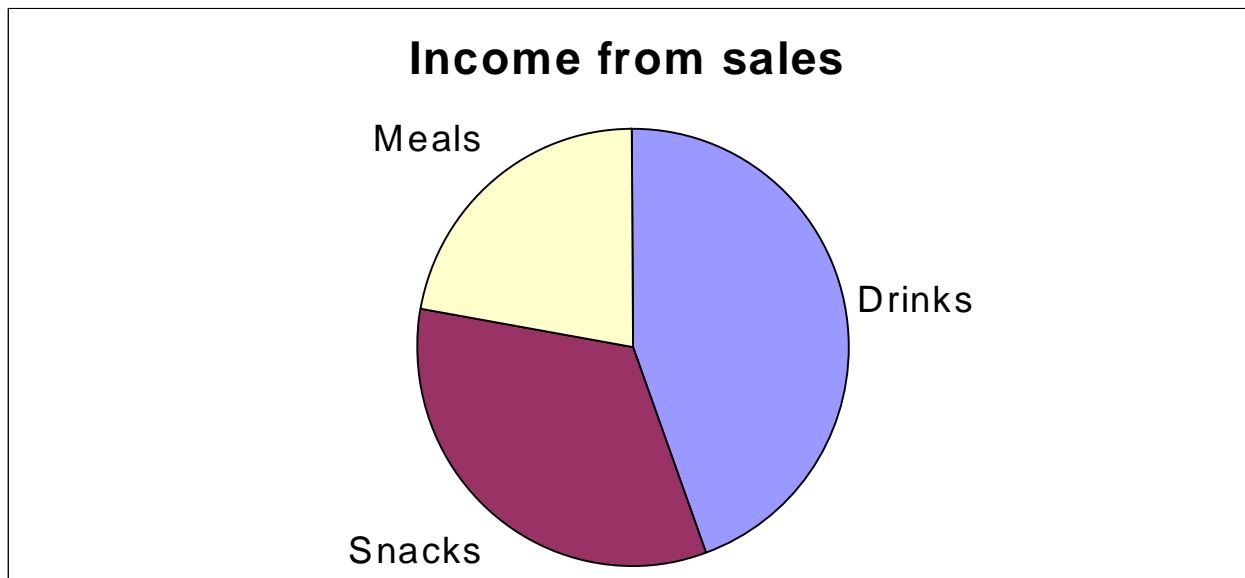
Group	Angle	Angle as a fraction of the full circle	Fraction of the total crowd	
Women	180°	$\frac{180}{360}$	$\frac{180}{360}$ x 12,000	6,000
Men	120°	$\frac{120}{360}$	$\frac{120}{360}$ x 12,000	4,000
Children	60°	$\frac{60}{360}$	$\frac{60}{360}$ x 12,000	2,000
Total	360°	$\frac{180}{360}$		12,000

Self assessment 1 - Reading Pie Charts

1. The pie chart below shows the results for students on an IT course. There were a total of 90 students on the course. Calculate the number in each category.



2. The pie chart below shows the income from sales for one week. If the total sales for that week were £4,500, calculate the sales for each sector.



Constructing Pie Charts - Calculating the Angles

Eg A survey of 300 shoppers in the city centre found that 50 had travelled by car, 90 by Metro and 160 by bus. Show this information in a pie chart.

This time you know the number in each group but you need to work out the angle for each.

- The number travelling by car was 50.
- The total number interviewed was 300.
- So the fraction of the total travelling by car was 50 out of 300 = $\frac{50}{300}$
- You then need to represent this as a fraction of the whole circle.
- The whole circle has 360° . So we need to work out 50×300 ths of 360° .
- Again it might help to set out your calculations in a table.
- Also remember to check that the total number of people adds up to 300 and that the total number of degrees adds up to 360.

Method of Travel	Number of People	Fraction of total number	Fraction of full circle	Number of degrees
Car	50	$\frac{50}{300}$	$\frac{50}{300} \times 360^\circ$	60°
Metro	90	$\frac{90}{300}$	$\frac{90}{300} \times 360^\circ$	108°
Bus	160	$\frac{160}{300}$	$\frac{160}{300} \times 360^\circ$	192°
Total	300			360°

Self Assessment Two - Constructing Pie Charts

1. A survey of 600 passengers at Manchester Airport found people going to the following destinations:-

Display this data in a Pie Chart.

Destination	Number of Passengers
London	50
New York	100
Ibiza	50
Islamabad	250
Hong Kong	150

Main Heating	Number of Houses
Oil	20
Gas	280
Electricity	190
Coal	
Total	500

Answers

Self assessment 1 - Reading Pie Charts

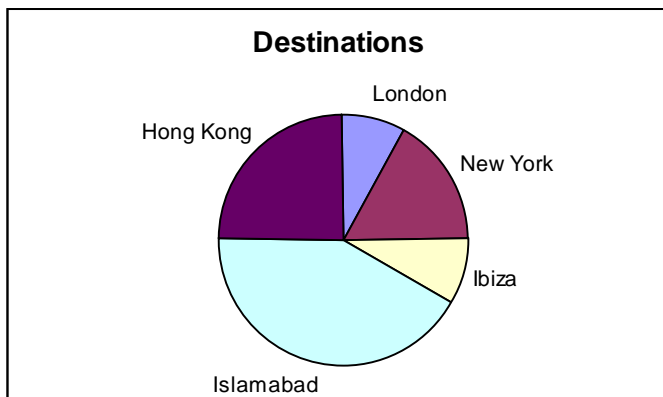
1.

Student Results	Angle	Angle as a fraction of the full circle	Fraction of total number of students	Number of students
Did not complete	80°	$\frac{80}{360}$	$\frac{80}{360} \times 90$	20
Partial	32°	$\frac{32}{360}$	$\frac{32}{360} \times 90$	8
Pass	72°	$\frac{72}{360}$	$\frac{72}{360} \times 90$	18
Merit	136°	$\frac{136}{360}$	$\frac{136}{360} \times 90$	34
Distinction	160°	$\frac{40}{360}$	$\frac{40}{360} \times 90$	10

Answers

Self Assessment Two - Constructing Pie Charts (contd)

1.



2.

Main Heating	Number of Passengers	Fraction of total number	Fraction of full circle	Number of degrees
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