Guidance for tutors

Outcome	S1	**Student can consistently:**	Draw and interpret a pie chart.
How the topic is examined	• Examined through test paper questions. • Questions are equally likely to appear on calculator and non-calculator papers. • In order to draw pie charts students will need a pair of compasses and protractor as well as a ruler and pencil. • Students could be asked to draw or complete a pie chart given information. Alternatively students could be presented with a pie chart and they have to extract information from it.		

Prior knowledge	• Students should be confident:
	  ○ Multiplying and dividing without a calculator.
	  ○ Simplifying fractions.
	  ○ Ratio and proportion (NR1, NR2)		

Suggested tuition approaches	• Students should be aware that a pie chart is a graphical representation of data. Pie charts are circular.
	• Each sector in a pie chart would represent a different category within the data.
	• Students could be asked to draw or complete a pie chart given information. Alternatively students could be presented with a pie chart and they have to extract information from it (either a particular value given the total or find the total).
	
	1) Drawing a pie chart
	  ○ In order to draw a pie chart, students will need to work out a set of angles for information given.
	  ○ Students need to remember that there are 360° in a full turn (circle)
	  ○ Angles for each section or category are calculated using the following formula
	
	$$Category\ angle = \frac{catgeory\ amount}{total\ amount} \times 360$$
	
	2) Interpreting a pie chart		

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	○ In order to find out the values of a particular category given you know the size of the sector, the following formula can be used: ○ $Category\ Amount = \frac{category\ angle}{360} \times total\ amount$ ○ If students have been given the category amount and angle and are asked to find the total amount you would use: ○ $Total\ amount = \frac{category\ amount}{category\ angle} \times 360$ • Pie charts are one of the most difficult graphs for students to get their head around. They generally rely on students being confident with ratio and proportion. • When pie charts are given on non-calculator papers, angles tend to be limited to 30°, 45°, 60°, 90° and 120° which are common fractions of a circle. • Occasionally angles are given in terms of percentages as opposed to angles.
Common errors and misconceptions	• Students mix up the above formulae. It is better for students to try to understand how to work with proportions rather than simply memorise the formulae. • They get answers for categories greater than the total amount. If this is the case students need to double check their working. • When drawing a pie chart they measure angles incorrectly. Students should take care and ask themselves whether the angle they have drawn looks correct.
Suggested resources	• Questions: ○ http://www.cimt.org.uk/projects/mepres/allgcse/bkb8.pdf (pp 105 – 111) ○ https://corbettmaths.files.wordpress.com/2013/02/drawing-pie-charts-pdf.pdf ○ https://corbettmaths.files.wordpress.com/2013/02/reading-pie-charts-pdf.pdf • Video tutorials: ○ http://corbettmaths.com/2013/02/27/drawing-a-pie-chart/

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	○ http://corbettmaths.com/2013/05/25/interpreting-pie-charts/ • Past GCSE Questions ○ https://keshgcsemaths.files.wordpress.com/2013/11/46_pie-charts2.pdf

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