PIE CHARTS

BASIC PIE CHARTS, MIXED-TOPIC PIE CHART QUESTIONS, COMPARATIVE PIE CHARTS

Examination Practice Questions

You should have:

A ruler, protractor, compasses, a pen, pencil, eraser, calculator.
For some questions, you may need tracing paper.

Instructions

- Use **black** ink or ball-point pen.
- Answer the questions in the spaces provided – *there may be more space than you need.*
- **Calculators may be used.**

Information

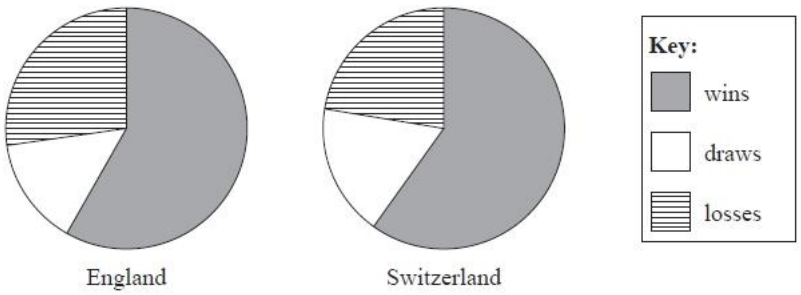
- The marks for each question are shown in brackets.
- Use the number of marks for each question as a guide as to how much time to spend on each question. As a rough guide, you can multiply the number of marks by 1.2 to see how many minutes you should spend on a question.
- Questions been carefully compiled from or modelled on a variety of past papers and will generally get more challenging as the document progresses. Some of the later questions will go beyond the core grade level for this topic.

Advice

- Read each question carefully before you start to answer it.
- Don’t forget to have fun.
- Check your answers at the end.

Q1. AtoZrevision.com

The pie charts show information about the proportion of wins, draws and losses in the matches played by the England football team and by the Switzerland football team for the years 2012 to 2015



Source: www.worldfootball.net

(a) Compare the proportion of losses for the two football teams.

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(1)

England played a total of 48 matches.

The angle representing wins in the England pie chart is 210°

(b) Work out how many of these matches were wins.

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(2)

Both teams had the same **number** of draws.

(c) Which team played the greater total number of matches?

Give a reason for your answer.

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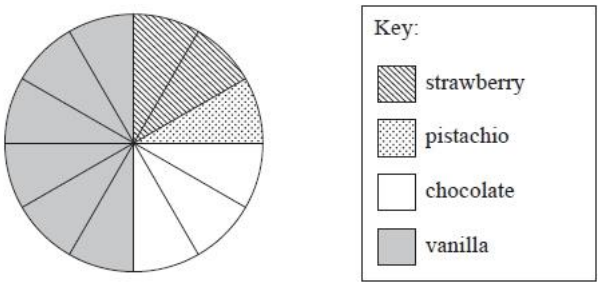
(2)

The pie chart shows information about the favourite flavour of ice cream for each of 24 people.



(a) Write down the most popular flavour of ice cream.

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(1)

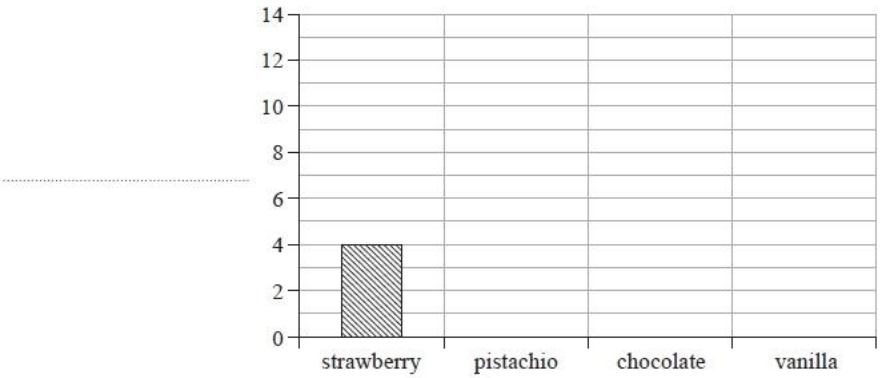
Strawberry is the favourite flavour of ice cream for 4 people.

(b) Show how this can be calculated from the pie chart.

(1)

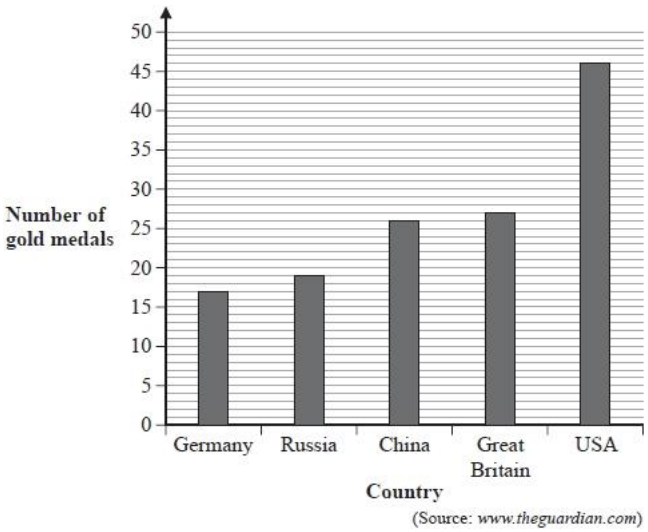
(c) Using the information in the pie chart, complete the bar chart.

Label the axes.



(4)

The bar chart shows information about the numbers of gold medals won in the 2016 Olympic Games by the five countries that won the most gold medals.



(a) Find the total number of gold medals won by the **three** countries that won the most gold medals.

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(1)

(b) Compare the number of gold medals won by Great Britain with the number of gold medals won by Russia.

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(1)

The information in the bar chart is going to be shown in a newspaper article.

(c) Explain why it might be more appropriate to use a pictogram.

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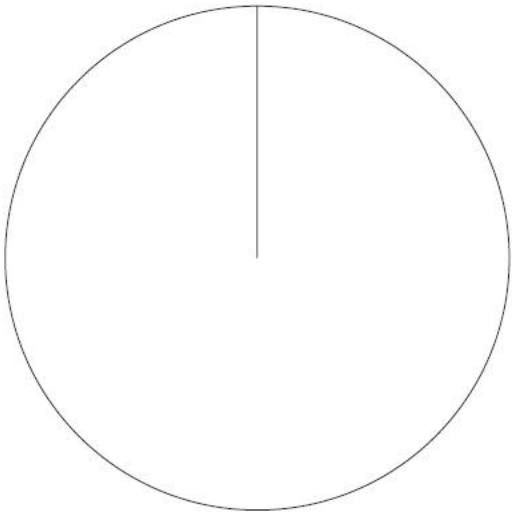
(1)

The table shows information about the numbers of gold, silver and bronze medals won by the USA in the 2016 Olympic Games.

Gold	Silver	Bronze	Total
46	37	38	121

(Source: *www.theguardian.com*)

(d) Complete the pie chart for this information.



(3)

In the 2016 Olympic Games, Great Britain won a total of 67 medals.
Of these, 27 were gold medals.

Sanjit says,

"The fraction of the medals won by the USA that were gold medals was greater than the fraction of the medals won by Great Britain that were gold medals".

(e) Determine whether or not the given information supports Sanjit's statement.

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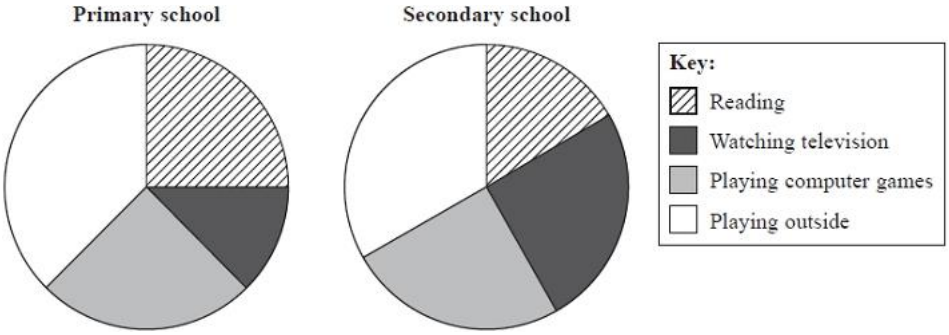
(2)

Simas is investigating what students like to do in their spare time.

He collected data by asking the students at a primary school and at a secondary school what they like to do in their spare time.

Simas asked each student at the two schools which of reading, watching television, playing computer games or playing outside they like best to do in their spare time.

The pie charts show information about the students' answers.



(a) What does the pie chart for the primary school students show about what they like best to do in their spare time?

Give one conclusion.

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(1)

(b) Compare what primary school students like best to do in their spare time with what the secondary school students like best to do in their spare time.

Give two comparisons.

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2 .....

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(2)

Nikola asks 50 male and 50 female drivers arriving at a car park if the type of car they are driving is petrol, diesel or electric.

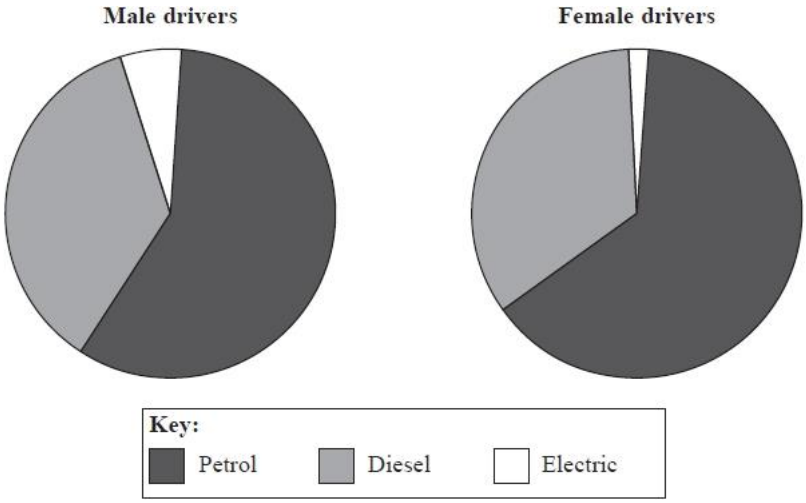
The two-way table shows some information about her results.

	Car type			
	Petrol	**Diesel**	**Electric**	**Total**
Male driver	29		3	50
Female driver		17	1	50
Total	61		4	100

(a) Complete the two-way table.

(2)

Nikola wants to compare her results for male drivers with her results for female drivers. To do this she uses the information she collected to draw the two pie charts shown below.



(b) Work out the angle for electric cars in the pie chart for male drivers.
You must show the calculation.

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(2)

Nikola told Seb how she collected her data. She then gave Seb a copy of each of her two pie charts and asked him to tell her what they showed.
Seb used the pie charts to reach the following conclusions.

(i) The most common type of car is diesel.

(ii) Males are more likely than females to be drivers of electric cars.

(c) Use the information in the **pie charts** to assess Seb's two conclusions.
You should also consider how Nikola's data collection method affects the reliability of Seb's conclusions.

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(5)

Alan records how he spends all the hours during one week.

The pie chart represents this information.

(a) What did Alan spend most hours doing?

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(1)

(b) Write down the fraction of the pie chart that represents working.

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(1)

(c) Estimate the average number of hours per day Alan was working.

..... hours

(1)

Q7. AtoZrevision.com

Mobile phones use one of a number of Operating Systems.

The table shows information about worldwide sales of mobile phones during Quarter 3 of 2012 and Quarter 3 of 2013

Operating System	Quarter 3 of 2012		Quarter 3 of 2013	
	Sales (millions)	Market Share (%)	Sales (millions)	Market Share (%)
Android	124.5	72.6	205.0	81.9
iOS	24.6	14.3	30.3	12.1
Microsoft	4.0	2.3	8.9	3.6
Blackberry	8.9	5.2	4.4	1.8
Other	9.5	5.5	1.6	0.6
Total	171.6	100.0	250.2	100.0

(Data source: adapted from Gartner, November 2013)

(a) Describe what happened to the total sales of mobile phones between Quarter 3 of 2012 and Quarter 3 of 2013

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(1)

(b) Which Operating System more than doubled its number of sales?

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(1)

(c) Which Operating System had the biggest change in Market Share percentage?

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(1)

The Market Share (%) column for Quarter 3 of 2012 adds up to 99.9 but the total is given as 100.0

(d) Give a reason why.

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(1)

Debra plans to draw comparative pie charts to show the information in the table for each year.

(e) Give a reason why she might do this instead of drawing multiple bar charts.

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(1)

(f) Find the size of the angle she should use for iOS in the 2012 pie chart.

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(2)

Debra uses a radius of 5 cm for the 2012 pie chart.

(g) Work out the radius she should use for the 2013 pie chart.

..... cm

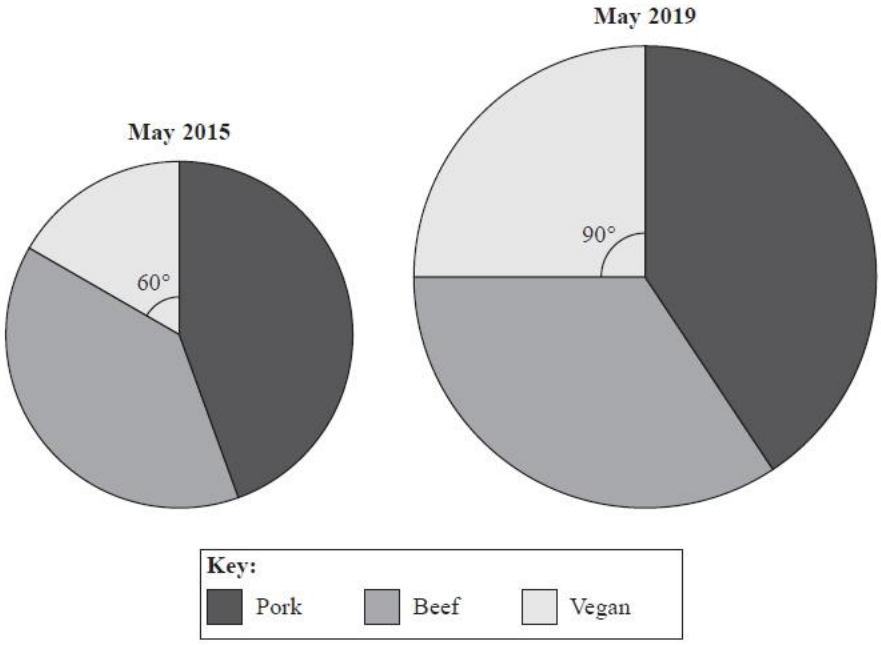
(2)

Q8. AtoZrevision.com

Three types of sausage are sold in a farm shop, pork, beef and vegan.

The comparative pie charts show information about the number of packs of these sausages sold in the farm shop in May 2015 and in May 2019

The pie charts are drawn accurately and the angles for the vegan sectors are shown.



The radius of the pie chart for May 2019 is greater than the radius of the pie chart for May 2015

(a) Explain what can be deduced from this information.

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(1)

30 packs of vegan sausages were sold in the farm shop in May 2015.

(b) Work out the number of packs of vegan sausages that were sold in the farm shop in May 2019

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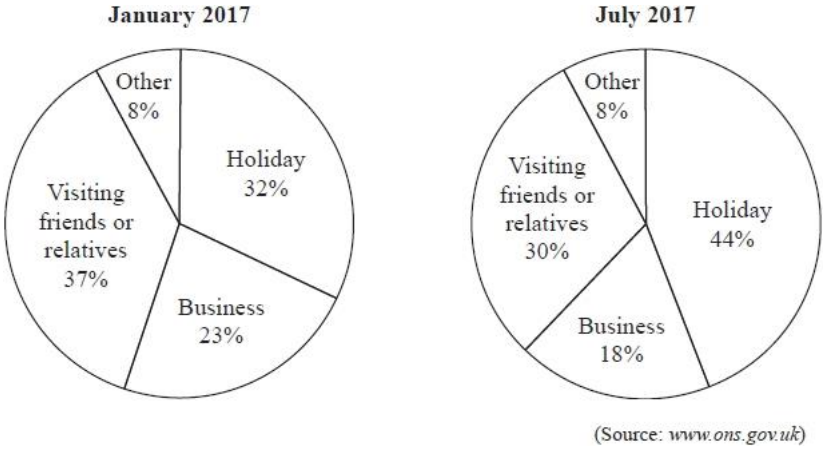
(3)

The pie charts show information about the numbers of visitors to the UK for the given reasons in January 2017 and in July 2017



(Source: *www.ons.gov.uk*)

(a) The pie charts do **not** show that there were more visitors to the UK on business in January 2017 than in July 2017
Explain why.

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(1)

The number of visitors to the UK in January 2017 in order to visit friends or relatives is 1 080 733

(b) Work out the number of visitors to the UK in January 2017 to have a holiday.

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(2)

The table gives information about the total number of visitors to the UK in January 2017 and in July 2017

Month	Total number of visitors (thousands)
January 2017	2931
July 2017	4020

Ruth thinks there is a more appropriate way to draw pie charts now that she knows the information in the table.

(c) Explain, giving reasons, how she should do this.

You must refer to the information in the table in your explanation.

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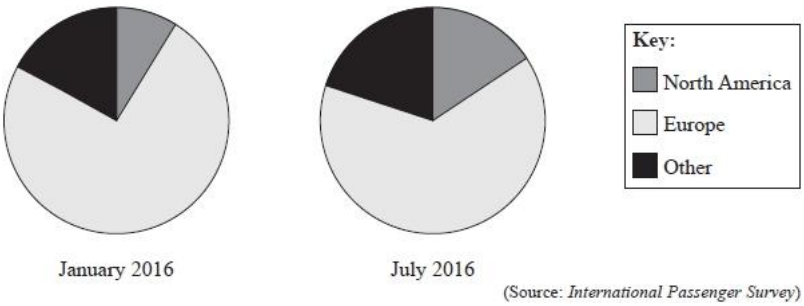
(5)

Q10. AtoZrevision.com

The pie charts show information about the departure country of the overseas visitors to the UK in January 2016 and in July 2016



(Source: *International Passenger Survey*)

Based on the two pie charts, Raul makes these two conclusions.

1 There are more visitors from Europe than from North America in both months.

2 There are more visitors from Europe in January than in July.

(a) Assess the validity of each of Raul's conclusions.

1 .....

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2 .....

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(2)

Judith decides to replace the pie charts with comparative pie charts.

(b) Explain how comparative pie charts are more appropriate than pie charts to compare the number of visitors in each month.

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(1)

The total number of overseas visitors to the UK in January 2016 was 2 599 000

The total number of overseas visitors to the UK in July 2016 was 3 786 000

Judith's comparative pie chart for January 2016 has radius 3 cm.

(c) Calculate the radius of Judith's comparative pie chart for July 2016

Give your answer correct to 1 decimal place.

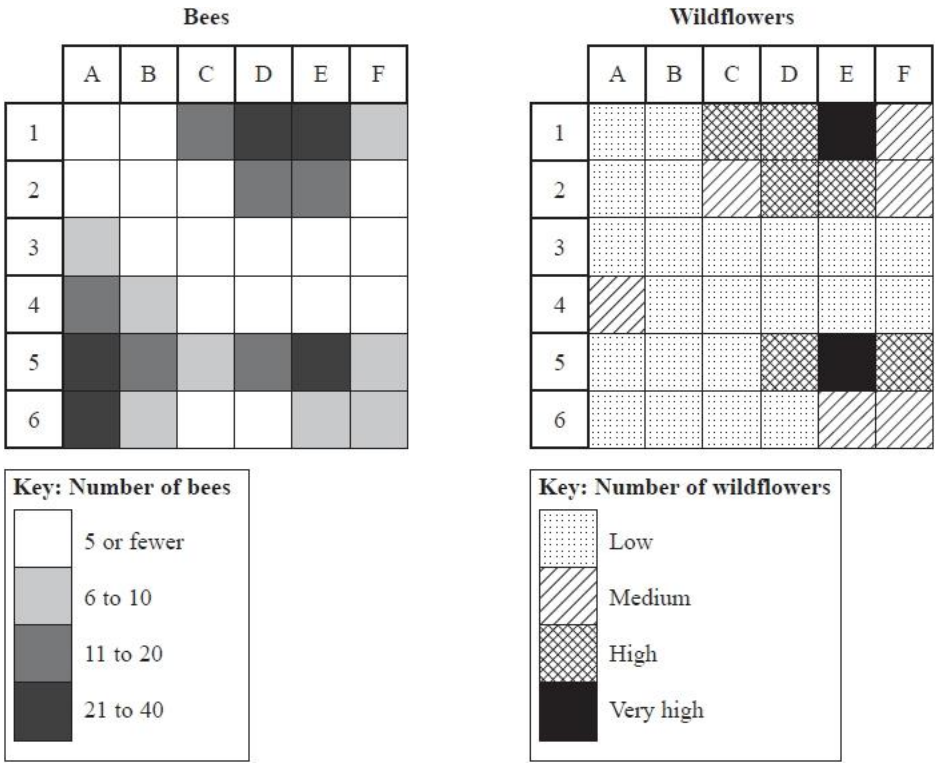
..... cm

(2)

Hilary and Mika are investigating the distribution of bees in a nature reserve.

They have divided the nature reserve into 36 squares of equal size.
The number of bees observed in each square in a fixed time period was recorded.
The number of wildflowers observed in each square was also recorded.

The choropleth maps below are drawn using this information.



Hilary says that there are more bees in those regions of the nature reserve with greater numbers of wildflowers.

(a) Does the information in the choropleth maps support her conclusion?

Give reasons for your answer.

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(2)

Hilary and Mika are producing a report about the nature reserve.

They want to include information about the types of small mammals recorded in the nature reserve in one week in 2008 and in one week in 2018

Hilary thinks that they should use pie charts.

Mika thinks that they should use comparative pie charts.

(b) What advice would you give to Hilary and to Mika on their choice of diagram?

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(2)

Mika is drawing his comparative pie charts.

He has the following information about the total number of small mammals recorded in one week in 2008 and in one week in 2018 in the nature reserve.

	2008	2018
Total number of small mammals	236	349

Mika is going to use a circle of radius of 5 cm for his pie chart for 2008

(c) Calculate the radius of the circle that Mika should use for his comparative pie chart for 2018 Give your answer correct to 1 decimal place.

..... cm

(2)

The table shows the number, in millions, of visitors to each of four tourist attractions in 2005 and in 2018

Attraction	Number of visitors in 2005 (millions)	Number of visitors in 2018 (millions)
British Museum	4.5	5.8
Tower of London	1.9	2.9
Edinburgh Castle	1.2	2.1
St Paul's Cathedral	0.7	1.7
Total	8.3	12.5

(Source: *www.alva.org.uk*)

Jill draws two comparative pie charts for the information in the table.

(a) Describe an advantage of using comparative pie charts for this information rather than using ordinary pie charts.

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(1)

(b) (i) Compare the angles for the sectors in the pie charts representing the British Museum in Jill's comparative pie charts for 2005 and for 2018

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(1)

(ii) Compare the areas for the sectors in the pie charts representing the British Museum in Jill's comparative pie charts for 2005 and for 2018

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(1)

Jill's comparative pie chart for 2005 has radius 5 cm.

(c) Calculate the radius of Jill's comparative pie chart for 2018

Give your answer correct to one decimal place.

..... cm

(2)

In a survey, children were asked to state their main source of news.

They were also asked how interested they were in the news.

The table shows the results of the survey for those stating Newspapers as their main source of news.

Level of interest	Number of children
Very	60
Quite	73
Not very	18
Not at all	1
Total	152

(Source: *www.ofcom.org.uk/research-and-data/data/statistics/stats20*)

For those who said Radio is their main source of news, 65 responded 'Very' as their level of interest.

Comparative pie charts are drawn to represent the responses for Newspapers and for Radio.

(a) Compare the area of the sector for 'Very' in the pie chart for Newspapers with the area of the sector for 'Very' in the pie chart for Radio.

Give a reason for your answer.

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(2)

The radius for the pie chart for Newspapers is 3 cm.

The radius for the pie chart for Radio is 4.7 cm.

(b) Calculate the size of the angle for the sector for 'Very' in the pie chart for Radio.

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(3)