



S21-test Pie Charts: Test Pack

EDEXCEL 1ST0 · Calculator allowed · about 25 minutes

Total Marks

Name: _____ Date: ____ / ____ / ____

Answer ALL questions. Show all your working.

1 For each statement about pie charts, write down whether it is True or False.

(i) In a pie chart, the angles of all the sectors must add up to 360 degrees. (1)

.....

(ii) A pie chart can only be used when there are exactly four categories of data. (1)

.....

(Total for Question 1 is 2 marks)

2 A pie chart is split into two sectors, 'Yes' and 'No'. The 'Yes' sector has an angle of 210 degrees. Write down the angle of the 'No' sector.

(Total for Question 2 is 1 mark)

3 60 people were asked how they usually travel to work. The table shows the results.

Method	Car	Bus	Walk	Cycle
Frequency	27	15	12	6

The results are to be shown in a pie chart.

(a) Calculate the angle of the sector that represents Bus. (2)

.....

(b) Explain why the angles for all four methods of travel must add up to 360 degrees. (1)

(Total for Question 3 is 3 marks)

- 4 A pie chart is going to show the results of a pet survey. A student has calculated these angles.

Pet	Dog	Cat	Fish	Other
Angle	130 deg	110 deg	90 deg	40 deg

Explain why the student must have made an error.

(Total for Question 4 is 2 marks)

- 5 125 shoppers were surveyed about their payment method. The pie chart shows that 40% of shoppers chose Cash. Work out the angle representing Cash.

(Total for Question 5 is 2 marks)

- 6 State one disadvantage of a pie chart, compared with a bar chart, in terms of reading exact values.

(Total for Question 6 is 1 mark)

7 A researcher has collected data on the favourite music genre of pupils across 12 different age groups. She is deciding whether to present the data as a pie chart or as a bar chart.

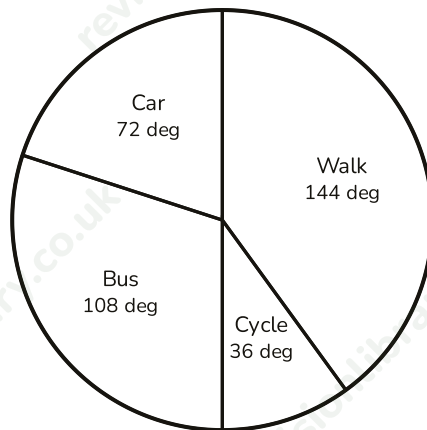
- (a)** Give one advantage of using a pie chart, rather than a bar chart, to display data for a single age group. **(1)**

- (b)** Give one disadvantage of using a pie chart, rather than a bar chart, to display data for a single age group. **(1)**

- (c)** The researcher has 12 different age groups to compare. Explain why a pie chart might not be a good choice for displaying this particular data set. **(2)**

(Total for Question 7 is 4 marks)

- 8** Amir wants to find out how pupils in his school year travel to school. He plans to survey 60 pupils.



- (a) Write a suitable survey question Amir could use to collect this data. (1)

- (b) Amir collects the data and organises it into the frequency table below. (2)

Method	Walk	Cycle	Bus	Car
Frequency	24	6	18	12

Calculate the angle needed to represent Cycle in a pie chart.

- (c) Amir then draws the pie chart shown above from his full results. He claims: 'More than a third of the pupils travel to school by bus.' Use the pie chart to decide whether Amir's claim is correct. You must show your working. (2)

(Total for Question 8 is 5 marks)

- 9** A student says: "In a pie chart with 3 sectors of 200, 100 and 60 degrees, since 200 is roughly double 100, twice as many people must be in the 200 degree sector as in the 100 degree sector." Evaluate this statement, and check whether the three angles could actually represent a valid pie chart.

(Total for Question 9 is 3 marks)

Mark scheme · S21-test Pie Charts: Test Pack

Question 1

- (i) **B1** True cao
- (i) **Answer: True**
- (ii) **B1** False cao
- (ii) **Answer: False**

Question 2

- **B1** 150 (degrees) cao
- **Answer: 150 degrees**

Question 3

- (a) **M1** $15/60 \times 360$, oe
- (a) **A1** 90 (degrees) cao
- (a) **Answer: 90 degrees**
- (b) **B1** the pie chart is a full circle (360 deg) that represents the whole sample/everyone surveyed, oe
- (b) **Answer: The whole circle (360 degrees) represents all 60 people surveyed, so the four sectors must share out all 360 degrees between them.**

Question 4

- **M1** $130 + 110 + 90 + 40$, oe (adds the four angles)
- **A1** 370 found and compared to 360 (angles in a pie chart must sum to 360 deg), so there is an error
- **Answer: $130+110+90+40 = 370$, which is not 360, so the angles cannot be correct.**

Question 5

- **M1** 0.4×360 , oe
- **A1** 144 (degrees) cao
- **Answer: 144 degrees**

Question 6

- **B1** it is harder to read off exact frequencies from a pie chart, since there is no frequency scale, oe
- **Answer: It is harder to read exact frequencies from a pie chart, since there is no frequency scale like a bar chart's axis.**

Question 7

- (a) **B1** a pie chart shows each category as a clear proportion/fraction/percentage of the whole set, which is easy to compare visually, oe
- (a) **Answer: A pie chart shows immediately how each genre's popularity compares as a share of the whole group, without needing a frequency scale.**
- (b) **B1** it is harder to read off exact frequencies from a pie chart than from a bar chart with a labelled frequency axis, oe
- (b) **Answer: It is harder to read exact numbers of pupils straight from a pie chart, since there is no frequency scale like a bar chart's axis.**
- (c) **B1** with 12 categories, many sectors would be small and/or similar in size to each other
- (c) **B1** so it becomes hard to distinguish/compare/label the sectors clearly, oe (dependent on identifying many small sectors)
- (c) **Answer: With 12 age groups, many sectors would be small and close in size, making them difficult to tell apart, label clearly or compare accurately.**

Question 8

- (a) **B1** a closed question with clear, non-overlapping response options covering all methods, e.g. 'How do you usually travel to school? Walk / Cycle / Bus / Car (tick one box)'
- (a) **Answer: How do you usually travel to school? Walk / Cycle / Bus / Car (tick one box)**
- (b) **M1** $6/60 \times 360$, oe
- (b) **A1** 36 (degrees) cao
- (b) **Answer: 36 degrees**
- (c) **B1** a third of 360 deg is 120 deg (or $18/60 = 30\%$ found), compared correctly with the Bus angle of 108 deg
- (c) **B1** correct conclusion: Amir's claim is incorrect, since $108 \text{ deg} < 120 \text{ deg}$ ($30\% < 33.3\%$)
- (c) **Answer: Amir's claim is incorrect: the Bus sector is 108 degrees, which is less than a third of 360 degrees (120 degrees).**

Question 9

- **M1** $200 + 100 + 60 = 360$, confirming this is a valid pie chart
- **B1** recognises that 200 is exactly (not just roughly) double 100
- **A1** since angle is directly proportional to frequency, the first sector has exactly twice the frequency of the second, oe
- **Answer: The angles sum to 360 ($200+100+60=360$), so this is a valid pie chart. Since angle is directly proportional to frequency, 200 degrees being exactly double 100 degrees means the first sector has exactly twice the frequency of the second, not just roughly.**