



GEO.SK3 Graphical Skills: Line Graphs, Bar Charts and Pie Charts

AQA 8035 · Calculators not allowed · about 40 minutes

Total Marks

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Name: _____ Date: ____ / ____ / ____

Answer all questions. Questions 5, 9 and 14 require answers in full sentences. Allow approximately 40 minutes for this pack.

- 1** Which of the following is the most appropriate graph to show how monthly rainfall changes over a year for a single location?

- ☐ A bar chart
- ☐ A pie chart
- ☐ A line graph
- ☐ A scatter graph

(Total for Question 1 is 1 mark)

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- 2** State one advantage of using a bar chart rather than a pie chart when comparing the population of five towns.

(Total for Question 2 is 1 mark)

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- 3** A small farm records the percentage of land used for three crops: wheat 45, barley 25, vegetables 20, and fallow 10. State the correct type of chart to show these proportions and give one reason why.

(Total for Question 3 is 2 marks)

- 4 The table shows monthly visitor numbers (in hundreds) to a small coastal town for six months.

Month	May	Jun	Jul	Aug	Sep	Oct
Visitors (hundreds)	8	15	22	20	12	6

Describe the general trend shown by the data for May to October.

(Total for Question 4 is 2 marks)

- 5 Figure A shows the monthly average temperature (degrees C) for a seaside town: Jan 6, Feb 7, Mar 9, Apr 12, May 15, Jun 18, Jul 20, Aug 20, Sep 17, Oct 13, Nov 9, Dec 6. Suggest a suitable graph to display this data and explain in one full sentence why it is suitable for these monthly temperature values.

(Total for Question 5 is 3 marks)

- 6 Complete the pie chart using the land-use data for a park: lawns 35%, trees 25%, flower beds 15%, playground 10%, pond 5%, paths 10%. Calculate the angle in degrees for the 'lawns' sector and state it to one decimal place.

(Total for Question 6 is 6 marks)

- 7 A school surveyed how many pupils cycle to school in each year group. The counts are: Year 7: 12, Year 8: 18, Year 9: 15, Year 10: 9, Year 11: 6. Suggest the most appropriate chart to show both the counts and make it easy to compare year groups, and give one sentence reason.

(Total for Question 7 is 2 marks)

- 8** Table shows weekly sales (units) of two flavours of ice cream over four weeks.

Week	1	2	3	4
Vanilla	120	140	160	150
Chocolate	100	130	150	170

Describe the pattern shown by the two lines if these data were plotted on a comparative line graph.

(Total for Question 8 is 4 marks)

- 9** A survey recorded the percentage of teenagers who use three social spaces after school: park 40%, youth club 25%, shopping area 35%. Suggest which chart would most clearly show the proportions and write one full-sentence justification referring to the data given.

(Total for Question 9 is 3 marks)

- 10** A company records average daily customers in two stores on a typical week: Mon 50, Tue 60, Wed 55, Thu 65, Fri 80. Calculate the mean number of customers per day for the week. Give your answer to one decimal place.

(Total for Question 10 is 2 marks)

- 11** A teacher plotted the bar chart for three classes showing numbers of pupils choosing different after-school clubs: Art 12, Football 18, Drama 9. State two reasons why the teacher might choose a compound bar chart if she also wanted to show male and female counts within each club.

(Total for Question 11 is 2 marks)

- 12** Complete the divided bar chart: A survey of 200 households records heating fuel: gas 90 households, electricity 50, oil 30, other 30. Calculate the percentage of households using gas and state the proportion as a percentage with one decimal place to be used on the divided bar.

(Total for Question 12 is 2 marks)

- 13** Table shows bicycle traffic counts at two junctions at peak hour for five weekdays.

Day	Mon	Tue	Wed	Thu	Fri
Junction A	120	130	125	135	140
Junction B	80	85	90	95	100

Suggest the best way to plot both junctions on one graph so differences and trends are clear, and give two brief points you would check on the axes before plotting.

(Total for Question 13 is 4 marks)

- 14** A small town recorded the following land-use percentages for a development plan: residential 40, commercial 15, industrial 10, open space 20, public services 10, other 5. Write one full sentence explaining why a pie chart might mislead viewers if the 'residential' slice is coloured very dark while others are pale.

(Total for Question 14 is 3 marks)

- 15** A research group collected monthly counts of a migrating bird arriving at a wetland: Feb 10, Mar 25, Apr 60, May 90, Jun 50. Which type of graph is best to show the peak month and the pattern of arrival, and give one short reason referring to the data?

(Total for Question 15 is 3 marks)

Mark scheme · GEO.SK3 Graphical Skills: Line Graphs, Bar Charts and Pie Charts

Question 1

- **B1** A bar chart, because monthly rainfall is a discrete total for each month rather than a continuously measured variable
- **Answer: A bar chart**

Question 2

- **B1** it is easier to compare exact values or differences between towns, oe
- **Answer: It is easier to compare exact values or differences between the towns.**

Question 3

- **B1** pie chart identified
- **B1** because it shows proportions of a whole visually, oe
- **Answer: Pie chart, because it shows proportions of the whole farm area visually.**

Question 4

- **B1** visitors increase from May to a peak in July, oe
- **B1** then decrease from July to October, oe
- **Answer: Visitor numbers rise from May to a peak in July, then fall steadily from July through to October.**

Question 5

- **B1** line graph identified
- **B1** because it shows change over time (months) clearly, oe
- **B1** reference to trend or seasonality in the explanation, e.g. to show gradual rise and fall through the year, oe
- **Answer: A line graph, because it clearly shows how temperature changes through the months and reveals the seasonal rise to July/August and fall towards winter.**

Question 6

- **M1** method: percentage $\times 360/100$ or $35/100 \times 360$ seen
- **A1** 126.0 degrees cao
- **B1** correct indication that total equals 360 degrees or noting other sectors sum to 360, oe
- **B1** correct rounding to one decimal place stated (126.0 degrees), oe
- **B1** final answer includes unit degrees, oe
- **B1** working shown that $35/100 \times 360 = 126$ or equivalent calculation seen, oe
- **Answer: 126.0 degrees**

Question 7

- **B1** bar chart identified
- **B1** reason: bar charts make comparing discrete counts between categories easy, oe
- **Answer: A bar chart, because bars make it easy to compare the number of pupils cycling in each year group.**

Question 8

- **B1** both flavours increase overall from week 1 to week 3, oe
- **B1** vanilla peaks in week 3 (160) then falls slightly in week 4 (150), oe
- **B1** chocolate rises steadily and continues to increase into week 4, reaching 170, oe
- **B1** by week 4 chocolate overtakes vanilla, oe
- **Answer: Both flavours increase from week 1 to week 3; vanilla peaks at 160 in week 3 then falls to 150 in week 4, while chocolate continues to rise to 170 in week 4, so chocolate overtakes vanilla by week 4.**

Question 9

- **B1** pie chart identified
- **B1** reason: it shows proportions of a whole directly, oe
- **B1** reference to the given percentages in justification, e.g. park is the largest slice at 40%, oe
- **Answer: A pie chart, because it shows the proportions of the whole directly, for example the park would be shown as the largest slice at 40%.**

Question 10

- **M1** method: $(50+60+55+65+80)/5$ seen
- **A1** 62.0 cao
- **Answer: 62.0**

Question 11

- **B1** it allows the total per club and the breakdown by male/female to be seen together, oe
- **B1** it makes comparison between clubs and between genders within the same club straightforward, oe
- **Answer: A compound bar chart shows both the total per club and the male/female breakdown together, and it makes comparison between clubs and comparison between genders within each club straightforward.**

Question 12

- **M1** method: $90 / 200 \times 100$ seen
- **A1** 45.0% cao
- **Answer: 45.0%**

Question 13

- **B1** suggestion: comparative line graph or two lines on one graph
- **B1** check 1: x-axis labelled with weekdays and evenly spaced, oe
- **B1** check 2: y-axis scale appropriate to include 0 and at least up to 150 with consistent intervals, oe
- **B1** additional check: include legend to distinguish Junction A and B, oe
- **Answer: Plot both as lines on a comparative line graph. Check that the x-axis is labelled with weekdays and evenly spaced, and the y-axis scale includes 0 and goes up to at least 150 with regular intervals; include a legend to distinguish the two junctions.**

Question 14

- **B1** colour emphasis can give visual weight beyond the actual proportion, oe
- **B1** this could make residential appear more important than the numeric percentage warrants, oe
- **B1** statement in a full sentence required, oe
- **Answer: Colouring the residential slice very dark could give it undue visual weight and make it seem more important than its actual 40% share, misleading viewers about the relative proportions.**

Question 15

- **B1** line graph identified
- **B1** reason: it shows rise to a clear peak in May and subsequent fall, oe
- **B1** reference to the peak month value (90) or pattern required, oe
- **Answer: A line graph, because it clearly shows the rapid increase to the peak in May (90 birds) and the fall afterwards.**