



GEO.SK9 Graphical Skills: Population Pyramids, Triangular Graphs and Radial Graphs

AQA 8035 · Calculators not allowed · about 40 minutes

Total Marks

--

Name: _____ Date: ____ / ____ / ____

Answer in full sentences for the longer 3 mark or above items only. Short items and calculations may be answered in phrases, numbers or labelled diagrams. Time guidance: 40 minutes for the whole pack.

- 1** Define what a population pyramid is, in the context of showing a country's age and sex structure.

(Total for Question 1 is 1 mark)

- 2** State one feature on a population pyramid that indicates a youthful population, in the context of a fictional country.

(Total for Question 2 is 1 mark)

- 3** Figure A shows age-group percentages for fictional Town L but only the female side is labelled. Using the data below for Town L, state the total percentage of the population aged 0-14.

Town L age distribution (percent of total population): 0-14: 32%, 15-64: 60%, 65+: 8%.

Context: population pyramid for Town L.

(Total for Question 3 is 1 mark)

- 4** Name one limitation of using a population pyramid alone to predict future economic dependency in a fictional country.

(Total for Question 4 is 1 mark)

- 5 Describe the population structure shown by the following fictional population pyramid data for Country P: 0-14 = 35%, 15-64 = 58%, 65+ = 7%. Mention shape and likely implications for services.

(Total for Question 5 is 3 marks)

- 6 Complete the population pyramid for fictional Country Q using the data below. The pyramid has five age groups on each side; you must provide the missing male percentages. Data given are percent of total population. Females are shown in the prompt; calculate male percentages assuming sex ratio is approximately equal and totals per age group are as given.

Age group	Total percent	Female percent (given)	Male percent (calculate)
0-4	8	4.2	?
5-14	14	7.3	?
15-24	16	8.0	?
25-54	46	23.5	?
55+	16	9.0	?

Context: Country Q population pyramid

(Total for Question 6 is 6 marks)

- 7 A simple dependency ratio for a fictional place is approximated as the sum of the young and elderly percentages divided by the working-age percentage. Using Country P data from Question 5 (0-14 = 35%, 15-64 = 58%, 65+ = 7%), calculate this dependency ratio as a percentage (dependents per 100 working-age people). Show your method.

(Total for Question 7 is 4 marks)

- 8 Triangular graphs (ternary plots) show three variables that sum to 100. The triangular graph provided has axes for Primary, Secondary and Tertiary employment as percentages that add to 100 for each country. Country X has employment structure: Primary 12%, Secondary 38%, Tertiary 50%. Plot the point for Country X on the triangular graph and give the three coordinates you would use to find its position (Primary, Secondary, Tertiary).

(Total for Question 8 is 4 marks)

- 9 Using the triangular graph method, describe the employment structure of fictional Country Y which plots at approximately Primary 30%, Secondary 20%, Tertiary 50%. Give two descriptive points about the likely economic character.

(Total for Question 9 is 2 marks)

- 10 A plotted point on a triangular graph reads off as Primary 5%, Secondary 25%, Tertiary 70%. Explain why this point cannot represent a diversified manufacturing economy, giving one reason referring to the three-sector structure.

(Total for Question 10 is 2 marks)

- 11** Radial graphs show values along spokes from a centre. The radial diagram supplied has five axes labelled Health, Education, Transport, Housing and Employment with scales 0 to 100. Complete the radial graph by plotting the following data for fictional Town R and identify which sector has the largest value: Health 68, Education 82, Transport 55, Housing 47, Employment 82.

Context: radial (polar) diagram for Town R quality indices out of 100.

(Total for Question 11 is 2 marks)

- 12** Using the radial graph values from Question 11 for Town R (Health 68, Education 82, Transport 55, Housing 47, Employment 82), suggest one practical conclusion a town planner might draw about investment priorities, giving the reason.

(Total for Question 12 is 1 mark)

- 13** On a radial graph, explain why it is useful to join the plotted points with lines to form a polygon when comparing sectors for a single town.

(Total for Question 13 is 1 mark)

- 14** A student plots a point on a triangular graph but forgets to check that the three percentages add to 100. Explain briefly why this check is important and give one consequence of failing to check this.

(Total for Question 14 is 1 mark)

Mark scheme · GEO.SK9 Graphical Skills: Population Pyramids, Triangular Graphs and Radial Graphs

Question 1

- **B1** a bar chart that shows the distribution of age groups split by male and female for a population, oe
- **Answer: A bar chart that shows the distribution of age groups split by male and female for a population.**

Question 2

- **B1** a wide base showing high proportions of young people (large 0-14 age groups), oe
- **Answer: A wide base showing high proportions of young people in the 0-14 age groups.**

Question 3

- **B1** 32% cao
- **Answer: 32%.**

Question 4

- **B1** it does not show future changes in fertility or migration that will affect dependency, oe
- **Answer: It does not show future changes in fertility or migration that will affect dependency.**

Question 5

- **B1** identifies a youthful population with a wide base (0-14 at 35%), oe
- **B1** notes a smaller elderly proportion (65+ only 7%), oe
- **B1** mentions implications such as pressure on schools and childcare and lower immediate pension costs, oe
- **Answer: Country P has a youthful population with a wide base (0-14 = 35%) and a small elderly group (65+ = 7%). This implies pressure on schools and childcare services and lower current costs for pensions and elderly care.**

Question 6

- **M1** shows method for calculating male percent by subtracting female percent from total percent for at least one age group, oe
- **A1** 0-4 male percent 3.8% cao
- **A1** 5-14 male percent 6.7% cao
- **A1** 15-24 male percent 8.0% or 8.0 cao
- **A1** 25-54 male percent 22.5% cao
- **A1** 55+ male percent 7.0% cao
- **Answer: Male percentages: 0-4 = 3.8%, 5-14 = 6.7%, 15-24 = 8.0%, 25-54 = 22.5%, 55+ = 7.0%.**

Question 7

- **M1** method seen: (young + elderly) / working-age seen, oe
- **M1** numeric substitution seen: $(35 + 7) / 58$ seen, oe
- **A1** result 0.724137... written or equivalent, oe
- **A1** answer given as 72.4 dependents per 100 working-age people (or 72.4%) cao
- **Answer: Dependency ratio = $(35 + 7) / 58 = 42 / 58 = 0.7241379...$, which is 72.4 dependents per 100 working-age people, rounded to one decimal as 72.4%.**

Question 8

- **M1** states that Primary = 12, Secondary = 38, Tertiary = 50 seen, oe
- **M1** shows understanding that these three add to 100 or states $12 + 38 + 50 = 100$, oe
- **A1** coordinates given as (Primary 12%, Secondary 38%, Tertiary 50%) cao
- **B1** diagrammatic plotting indicated or described correctly, oe, e.g. point located towards Tertiary corner with given proportions
- **Answer: Coordinates: Primary 12%, Secondary 38%, Tertiary 50%. On the triangular graph the point is plotted close to the Tertiary corner, following the 12% Primary and 38% Secondary guidelines.**

Question 9

- **B1** identifies that Country Y has a relatively high Primary sector (30%) and high Tertiary (50%), oe
- **B1** gives implication, e.g. partly agricultural or resource-based but also significant services sector, oe
- **Answer: Country Y has a substantial Primary sector (about 30%) and a large Tertiary sector (about 50%); this suggests the economy still relies on agriculture or raw materials but also has a strong services sector, with a smaller manufacturing base.**

Question 10

- **B1** notes that Secondary (manufacturing) is only 25%, which is low for a manufacturing-focused economy, oe
- **B1** gives implication, e.g. high Tertiary (70%) suggests services dominate instead of manufacturing, oe
- **Answer: Secondary employment is only 25%, which is low for a diversified manufacturing economy; instead Tertiary at 70% shows a services-dominated economy, so manufacturing is not the main driver.**

Question 11

- **M1** plots or lists values correctly on axes or shows method of plotting, oe
- **A1** identifies Education and Employment as jointly largest at 82 cao
- **Answer: Plotted values are Health 68, Education 82, Transport 55, Housing 47, Employment 82. The largest values are Education and Employment, both 82.**

Question 12

- **B1** suggests investment in weakest area, e.g. improve Housing or Transport because they have lower scores, and gives reason, oe
- **Answer: Invest in Housing or Transport, because Housing (47) and Transport (55) score much lower than Education and Employment, indicating weaker provision in those sectors that could limit quality of life and access to jobs.**

Question 13

- **B1** joining points shows the overall shape and makes comparisons of relative strengths and weaknesses easier at a glance, oe
- **Answer: Joining the points forms a polygon that shows the overall shape of strengths and weaknesses, making it easier to compare sectors visually and spot which areas are relatively strong or weak at a glance.**

Question 14

- **B1** states that the ternary plot requires components to sum to 100 and that failing to check leads to an incorrect plotted position or misinterpretation, oe
- **Answer: Because triangular graphs require the three components to sum to 100, you must check this; failing to do so results in an incorrectly placed point and possible misinterpretation of the economic structure.**