

Exercise walk-through

2.3

Population Composition

AP Human Geography

Reading age and sex structure

Population composition includes age structure and sex ratio. A **population pyramid** places sex categories on opposite sides and **age cohorts** vertically.

Read the date, age bands and horizontal units first: numbers and percentages answer different questions. A cohort bulge may reflect earlier births, migration or survival.

A large child cohort can imply future school demand, but forecasting needs assumptions about migration and cohort survival.

Schematic population pyramids

Large young cohorts
(wide base)
male female



Similar cohort sizes
(straight sides)



Fewer recent births
(narrow base)



age cohorts stack from young (bottom) to old (top)
schematic relative cohort sizes · shapes alone do not establish growth or a DTM stage

Compare the youngest cohorts with the middle. Shape alone cannot identify a DTM stage.

Pyramid interpretation: worked reasoning

Observation	Supported interpretation and limit
Wide base	Many young people relative to older cohorts; consistent with recent high fertility, but not proof of a current growth rate.
Similar cohort sizes	Consistent with smaller changes between successive birth cohorts; migration and mortality still matter.
Narrow base	Fewer recent births relative to older cohorts. Total decline requires checking births, deaths and migration.

Age-based dependency: attempt

Age group	Original fictional town
0–14	3,000 people
15–64	6,000 people
65+	1,000 people

Calculate the total **dependency ratio** and elderly dependency ratio per 100 working-age people.

Does the result count actual workers supporting actual nonworkers? Explain.

Age-based dependency: worked check

Let $Y = 3000$, $W = 6000$ and $O = 1000$ denote the three age groups.

$$D = \frac{Y + O}{W} \times 100$$

$$D = \frac{3000 + 1000}{6000} \times 100 = 66.7$$

$$D_O = \frac{O}{W} \times 100$$

$$D_O = \frac{1000}{6000} \times 100 = 16.7$$

About 67 dependent-age people, including 17 older people, per 100 working-age people. Age is a proxy; employment, income and health are not measured.

Exercises 2.1-2.2

2.1 State what a wide base on a population pyramid indicates.

[2]

2.2 Define the dependency ratio.

[2]

Exercises 2.1-2.2

2.1 State what a wide base on a population pyramid indicates. [2]

2.1

- many young children; high birth rate / fast-growing population
-

2.2 Define the dependency ratio. [2]

2.2

- the ratio of dependents (under 15 and over 64) to the working-age (15-64) population

Exercise 2.3 (a)

2.3 A pyramid is narrow at the base and wide in the older groups.

(a) Describe this country's fertility.

[1]

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[1]

(a)

- low fertility / few children

Exercise 2.3 (b)

2.3 A pyramid is narrow at the base and wide in the older groups.

(b) State one challenge this age structure creates.

[1]

Exercise 2.3 (b)

2.3 A pyramid is narrow at the base and wide in the older groups.

(b) State one challenge this age structure creates.

[1]

(b)

- a rising elderly dependency burden – pensions, healthcare, shrinking workforce

Exercises 3.1-3.2

3.1 A country with a broad-based population pyramid most likely has

[1]

☐

A low fertility and an aging population

B high fertility and rapid growth

C equal numbers in every age group

D more males than females at all ages

3.2 The number of males per 100 females in a population is the

[1]

☐

A dependency ratio

B sex ratio

C arithmetic density

D rate of natural increase

Exercises 3.1-3.2

3.1 A country with a broad-based population pyramid most likely has

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A low fertility and an aging population

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3.1 B

- a wide base = high fertility and rapid growth

3.2 The number of males per 100 females in a population is the

[1]

☐

A dependency ratio

B sex ratio

C arithmetic density

D rate of natural increase

3.2 B

- males per 100 females is the sex ratio

Exercise 3.3 (a)

3.3 A country has a high youth dependency ratio.

(a) State which group makes the ratio high.

[1]

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(a)

- the large number of children (under 15)

Exercise 3.3 (b)

3.3 A country has a high youth dependency ratio.

(b) Explain one demand this places on the government.

[1]

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[1]

(b)

- heavy spending on schools/child health and future job creation