# Exercise walk-through

## The Size and Distribution of Cities ▪ 6.4

eXercise

# You must be able to

- state the **rank-size rule** 位序-规模法则
- define a **primate city** 首位城市
- outline **central place theory** 中心地理论
- explain the **gravity model** 引力模型

## Method — Rank-size rule

The **rank-size rule** says the nth-largest city is about 1/n the size of the largest — the 2nd city  1/2, the 3rd  1/3, and so on.

# Method — Primate city

A **primate city** is far larger than all others (more than twice the second city) and dominates the country economically and culturally.

# Method — Central place & gravity

**Central place theory** explains the size and spacing of settlements by the services they provide. The **gravity model** predicts interaction as proportional to size and inversely to distance squared.

## Practice 2.1 ▪ 2 marks

State the rank-size rule.

# Solution 2.1

Method: Rank-size rule

**Worked steps**

the nth largest city is about 1/n the size of the largest B1; e.g. the 4th city 1/4 of the largest B1.

## Practice 2.2 ▪ 2 marks

Define a primate city.

# Solution 2.2

Method: Primate city

**Worked steps**

a city more than twice the size of the next largest B1 that dominates the country B1.

## Practice 2.3 ▪ 2 marks

A country's largest city has 8 million people; the next largest has 1 million.
(a) Does this fit the rank-size rule or primacy? Explain.

# Solution 2.3

Method: Rank-size rule

**Worked steps**

(a) primacy B1 — the largest is far more than twice the second, not the ~4 million the rank-size rule predicts B1.

## Exam-style 3.1 ▪ 1 mark

If the largest city has 12 million people, the rank-size rule predicts the 3rd city has about

**A** 12 million

**B** 6 million

**C** 4 million

**D** 1 million

# Solution 3.1

Method: Rank-size rule

**A** 12 million

**B** 6 million

**C** 4 million ✓

**D** 1 million

**Worked steps**

**C**. 3rd city $12\text{M} \div 3 = 4$ million.

## Exam-style 3.2 ▪ 1 mark

The gravity model predicts that interaction between two cities increases with their size and decreases with

**A** their populations

**B** the distance between them

**C** their site

**D** their toponyms

# Solution 3.2

Method: Central place & gravity

**A** their populations

**B** the distance between them ✓

**C** their site

**D** their toponyms

## Worked steps

**B**. interaction falls with distance (squared) in the gravity model.

## Exam-style 3.3 ▪ 1 mark

A capital dominates its country, dwarfing every other city.
(a) Name this pattern.
(b) State one problem a primate city can cause.

# Solution 3.3

Method: Primate city

**Worked steps**

(a) primate city / urban primacy B1. (b) uneven development — resources and jobs concentrate in one city, neglecting the rest B1.