

ECO 461
International Economics
SP 2018

Name _____

Class Action: PPFs, Comparative Advantage and the Gains from Trade [100 points]

Assume there are two regions:

- A: Athens (Greece, a linguistic and cultural region, not a nation) and
- B: The land adjacent (especially north of) the Black Sea-- the Pontus region --a fertile alluvial area between the Bug and Dneiper Rivers)--home to 'barbarians' (defined by the Greeks as anyone who did not speak Greek)

And assume there are just two traded commodities:

- P: pottery (& the contents of those pots or amphorae-- wine & olive oil) and
- G: grain (barley, more easily grown in Greece's poor soil, and the highly coveted wheat)

Finally assume that the populations, the labor resource endowments of both regions, are comparable, but the fertility of the soil informs differences in efficiency and productivity that are captured mathematically by two production possibility frontiers:

Athens: $P = 50 - (50/25)*G$

The Black Sea: $P = 60 - (60/40)*G$

A. (9 points)

1. In autarchy, in **The Black Sea**, the domestic terms of trade (DTOT) are _____ (fraction in P/G terms) or _____ (decimal). This is the same as the MRT (marginal rate of transformation of pots for grain).

This implies--in barter terms-- that **60** pots may be exchanged for _____ G,
or _____ G = 1 P, or alternatively _____ P = 1 G.

That is, the opportunity cost of pots is _____, or the opportunity cost of grain is _____.

2. In autarchy, in **Athens**, the domestic terms of trade (DTOT) are _____ (fraction in P/G terms) or _____ (decimal).

This implies--in barter terms-- that **50** P may be exchanged for _____ G,
or _____ P = 1 G, or alternatively _____ G = 1 P.

That is, the opportunity cost of pots is _____ or the opportunity cost of grain is _____.

3. If you were a **seller of grain**, and could sell at prevailing domestic prices in either The Black Sea or Athens, where would a unit of grain fetch you more pots? _____ (The Black Sea, Athens)

If you were a **buyer of grain**, and buy in either The Black Sea or Athens, where would a unit of grain require the sacrifice of fewer pots? _____

4. If you were a **seller of pots**, and could sell at prevailing domestic prices in either The Black Sea or Athens, where would a unit of pots fetch you more grain? _____ (The Black Sea, Athens).

If you were a **buyer of pots**, and could buy from either regime, where would a unit of pots requires a greater outlay of grain? _____

B. (9 points) According to these formulae,

If The Black Sea opts to produce exclusively pots, it can produce as much as _____ units of P, while if Athens specializes completely in pots, it can produce as many as _____ units of P.

If The Black Sea specializes in grain, it can produce a maximum of _____ units of G, while if Athens produces no pots, it can produce a maximum of _____ units of G.

Athens: $P = 50 - (50/25) * G$
 The Black Sea: $P = 60 - (60/40) * G$

1. The Structure of Absolute Advantage

Apparently _____ (The Black Sea/Athens) has an absolute advantage in pots, and _____ (The Black Sea, Athens) has an absolute advantage in grain. Or, to put it another way, _____ (The Black Sea/Athens) has an absolute disadvantage in pots, and _____ (The Black Sea/Athens) has an absolute disadvantage in grain.

Adam Smith--the author of The Theory of Moral Sentiments and The Wealth of Nations--was at a loss to explain trade in this situation in which one country is absolutely superior in all pursuits. But **David Ricardo** came to the rescue with his theory of **comparative advantage**, arguing in The Principles of Political Economy and Taxation (1817) that it's all relative!

2. The Structure of Comparative Advantage

Because Athens is _____ (fraction) or _____ (decimal) times as efficient in pots as The Black Sea, but Athens is _____ (fraction) or _____ (decimal) times as productive as The Black Sea in grain, Athens is said to have a comparative advantage in the production and export of _____ (pots/grain).

Because The Black Sea is _____ (fraction) or _____ (decimal) times as efficient in pots as Athens, but The Black Sea is _____ (fraction) or _____ (decimal) times as productive in grain as Athens, The Black Sea is said to possess a comparative advantage in the production of _____ (pots/grain).

C. (14 points)

Complete the table below,

First, assume that each nation is in autarchy.

Autarchy	Athens	The Black Sea	The Black Sea + Athens
Production in autarchy			
Pots		33	
Grain			
Consumption in autarchy			
Pots	14		
Grain			

Assume that each nation follows Ricardo's recommendation in preparation for trade by specializing in the production of that commodity in which it possesses the comparative advantage:

Production with trade, consistent with Ricardo's recommendation: the R point

Production consistent with Ricardo's recommendation	Athens	The Black Sea	The Black Sea + Athens
Pots			
Grain			

By following Ricardo's advice, the world is 'up' by _____ pots and _____ grain!

This is the gain from specialization! And the two nations haven't even gotten around to trading yet!

Athens: $P = 50 - (50/25) * G$
 The Black Sea: $P = 60 - (60/40) * G$

D. CASES (48 points)

Now assume that each nation follows Ricardo's recommendation and that trade proceeds freely. A common terms of trade (TOT) will be established between the trading nations and all economic agents, participants, producers and consumers alike, will face the same prices. But there is a range of terms at which the nations may trade. *Note that only one case actually happens; they are mutually exclusive. But all cases presuppose the same structure of comparative advantage and assume that the nations have followed Ricardo's advice and completely specialized in the production of the goods in which they possess the comparative advantage.*

CASE 1	Athens	The Khanata	The Black Sea + Athens
<i>Consumption with trade</i>			
Pots		33	
Grain		18	

In this instance, Athens exports _____ units of _____ (pots/grain) to The Black Sea, while The Black Sea exports _____ units of _____ (pots/grain) to Athens.

Thus the terms of trade established between Athens and The Black Sea are _____ (fraction, P/G terms) or _____ (decimal, P/G terms). That is, $1 G = \text{_____} P$ or $\text{_____} G = 1 P$.

The Black Sea gains _____ units of pots and _____ units of grain (*relative to her consumption bundle in autarchy*); Athens gains _____ units of pots and _____ units of grain (*relative to her consumption basket in autarchy*).

Indicate, by circling the correct alphabet letter, which of the three possibilities below is accurate:

- This occurs because the TOT equals The Black Sea's DTOT.
- This occurs because the TOT equals Athens's DTOT.
- This occurs because the TOT is between the DTOT of both countries.

CASE 2	Athens	The Black Sea	The Black Sea + Athens
<i>Consumption with trade</i>			
Pots	14		
Grain		22	

In this instance, Athens imports _____ units of _____ (pots/grain) from The Black Sea, while The Black Sea imports _____ units of _____ (pots/grain) from Athens.

Thus the terms of trade established between Athens and The Black Sea are _____ (fraction, P/G terms) or _____ (decimal, P/G terms). That is, $1 P = \text{_____} G$ or $\text{_____} P = 1 G$.

The Black Sea gains _____ units of pots and _____ units of grain (*relative to her consumption bundle in autarchy*); Athens gains _____ units of pots and _____ units of grain (*relative to her consumption basket in autarchy*).

Indicate, by circling the correct alphabet letter, which of the three possibilities below is accurate:

- This occurs because the TOT equals The Black Sea's DTOT.
- This occurs because the TOT equals Athens's DTOT.
- This occurs because the TOT is between the DTOT of both countries.

CASE 3	Athens	The Black Sea	The Black Sea + Athens
<i>Consumption with trade</i>			
Pots		34	
Grain	19		

In this instance, Athens exports _____ units of _____ (pots/grain) to The Black Sea, while Athens imports _____ units of _____ (pots/grain) from The Black Sea.

Thus the terms of trade established between Athens and The Black Sea are _____ (fraction, P/G terms) or _____ (decimal, P/G terms). That is, $1 P = \text{_____} G$ or _____ $P = 1 G$.

The Black Sea gains _____ units of pots and _____ units of grain (*relative to her consumption bundle in autarchy*); Athens gains _____ units of pots and _____ units of grain (*relative to her consumption basket in autarchy*).

Indicate, by circling the correct alphabet letter, which of the three possibilities below is accurate:

- This occurs because the TOT equals The Black Sea's DTOT.
- This occurs because the TOT equals Athens's DTOT.
- This occurs because the TOT is between the DTOT of both countries.

E. GRAPHS (20 points)

On the next two separate pages, illustrate **CASE 3, AND ONLY CASE 3**, first for The Black Sea, then for Athens.

For each country (on two separate pages) plot and label

- the production possibility frontier, *PPF*, as a solid line, carefully revealing both intercepts numerically
- the consumption possibility frontier in autarchy, as *CPF_a*, carefully revealing both intercepts numerically
- the production point in autarchy: *Pa*
- the consumption point in autarchy: *Ca*
- the production point with trade: *Pt*
- the consumption point with trade: *Ct*
- the consumption possibility frontier with trade: *CPF_t*, as a dashed line: -----
- Using squiggles or a distinctive color, outline (~~~) the *trade triangle*.

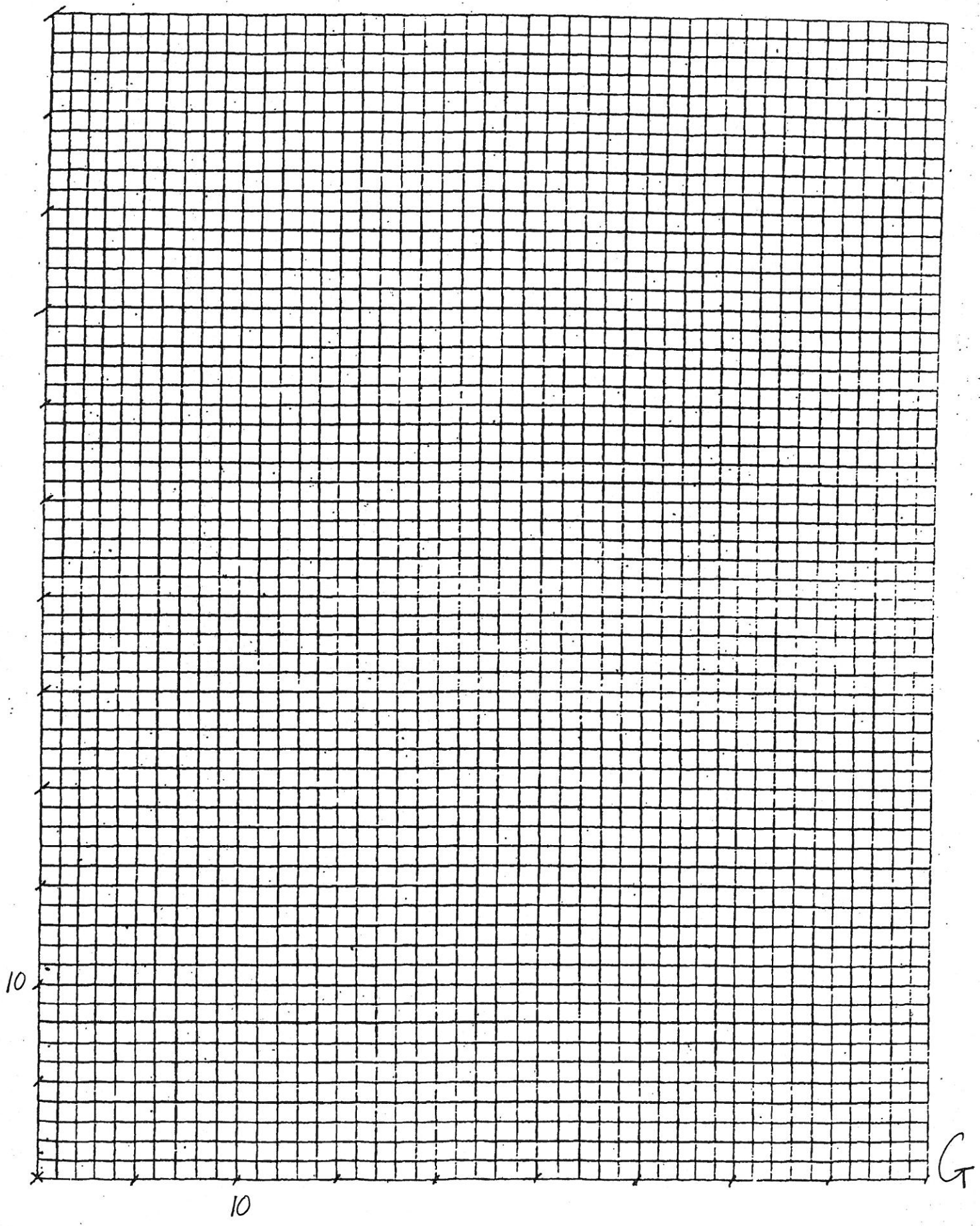
NOTE THAT ON THE EXAM YOU WILL ALSO HAVE TO WORK WITH INPUT/OUTPUT MATRICES—see DEMO: India & Mesopotamia-- and also PLOT THE WPPF (also in DEMO). You could try your hand at the WPPF for this class action, although NO POINTS ARE ALLOCATED TO IT HERE!

Graph the World Production Possibility Frontier, indicating

- both intercepts
- the joint production & consumption point as **A**
- the R point as **R**
- the anti R point as **anti R**, and
- the two nation's PPFs (segments of the WPPF) with PPF-Athens and PPF-Black Sea
- and labelling the WPPF itself clearly

P

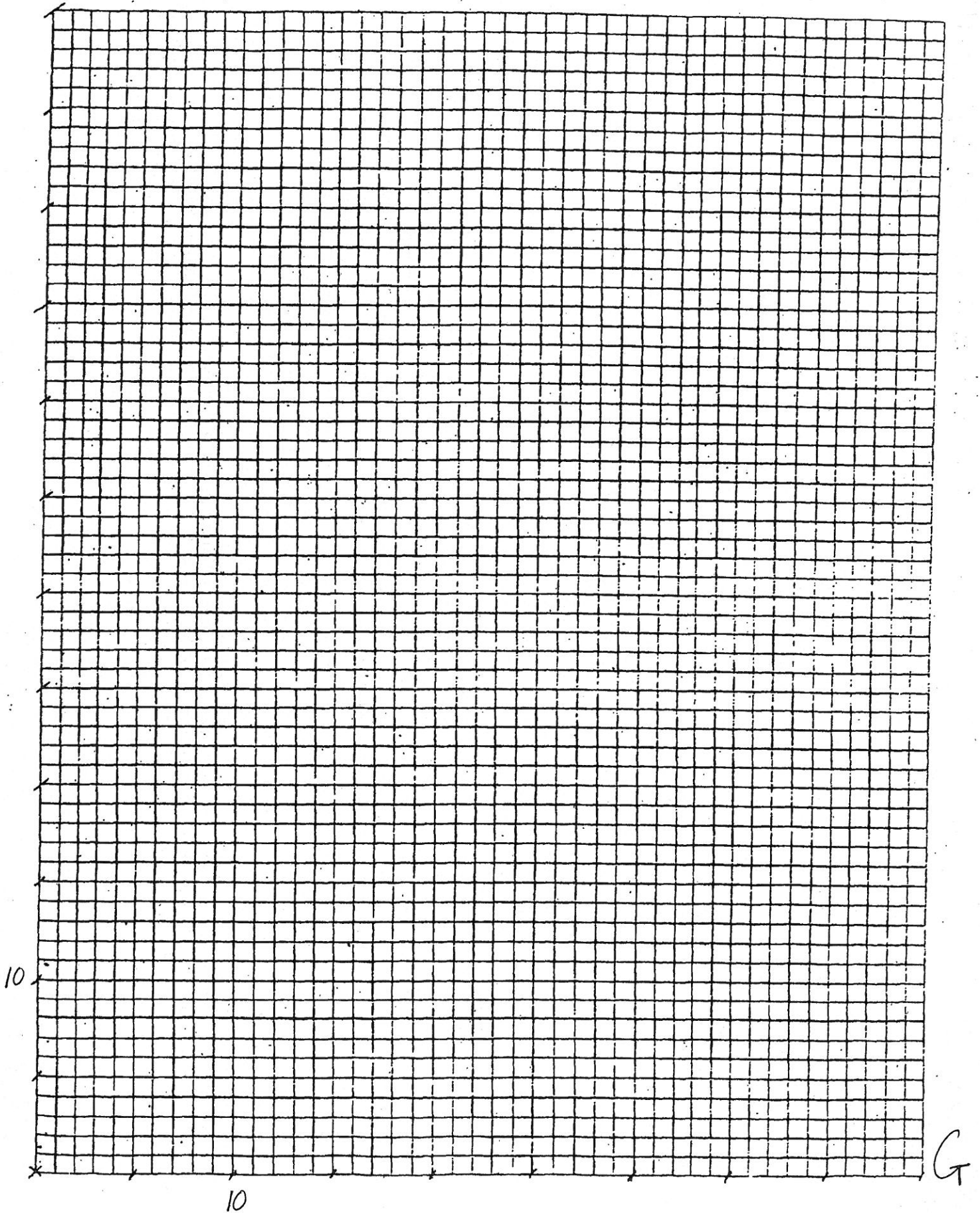
Athens



P

The Black Sea

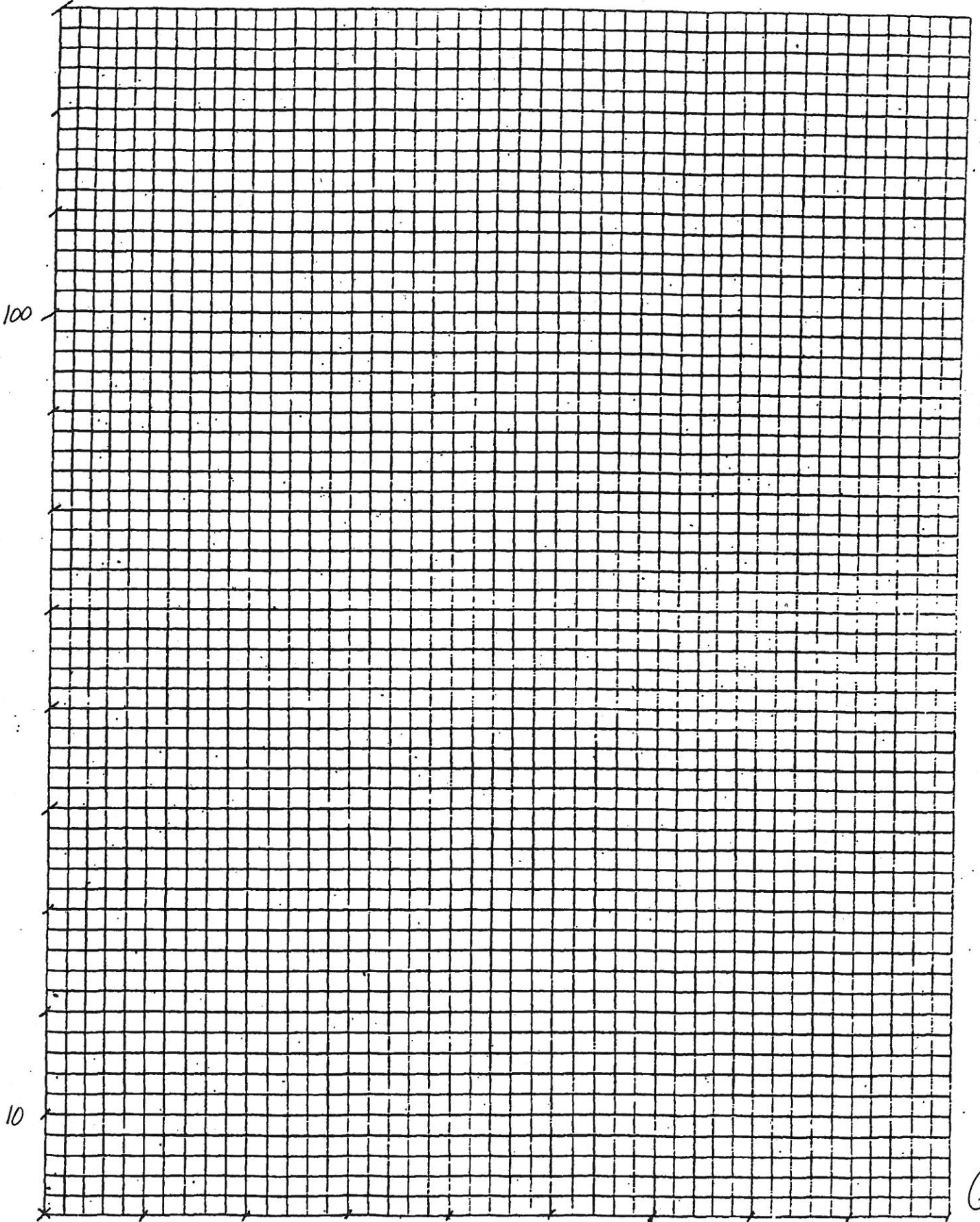
6



P

WORLD (A & B)

7



100

10

10

G

P

(extra)

