Wiedemann-Franz Law - Answer Sheet

Part A: Electric conductivity of copper, aluminum and brass (1.5 points)

A.1 (1.0 pt)

Magnet descend time:

number	Copper	Aluminum	Brass

A.2 (0.5 pt)

	Copper	Aluminum	Brass
Electrical conductivity			

Part B: Thermal conductivity of copper (3.0 points)

B.1 (0.1 pt)

Rod 1 temperature :

B.2 (0.5 pt)

B.3 (0.1 pt)

P =

B.4 (0.5 pt)

Time	T_1	T_2	T_3	T_4	T_5	T_6	T_7	T_8

B.5 (1.0 pt)
Draw in the additional graph papers the temperature as a function of location.

B.6 (0.5 pt)

$\kappa_0 =$

$\frac{\Delta T}{\Delta t} =$

B.7 (0.3 pt)

Circle the correct answer:

$\kappa > \kappa_0$ or $\kappa < \kappa_0$ or $\kappa = \kappa_0$

Part C: Estimating the heat loss and the heat capacity of copper (4.0 points)

C.1 (1.0 pt)

C.2 (1.0 pt)
Draw in the additional graph papers the average temperature as function of time

C.3 (1.0 pt)
Expression:

$c_p =$

$P_{loss} =$

Value:

$c_p =$

$P_{loss} =$

C.4 (1.0 pt)
Expression:

$\kappa_{copper} =$

Value:

$\kappa_{copper} =$

Part D: Measure the heat conductivity of brass and aluminum (1.0 points)

D.1 (0.1 pt)

Rod 2 : $T =$

D.2 (0.2 pt)

Reading time :

T_1	T_2	T_3	T_4	T_5	T_6	T_7	T_8

$\Delta T_{Copper-1}/\Delta x$	$\Delta T_{Brass}/\Delta x$	$\Delta T_{Aluminum}/\Delta x$	$\Delta T_{Copper-2}/\Delta x$

D.3 (0.7 pt)

Expression:

$\kappa_{Aluminum} =$

$\kappa_{Brass} =$

Value:

$\kappa_{Aluminum} =$

$\kappa_{Brass} =$

Part E: Wiedemann-Franz law (0.5 points)

E.1 (0.5 pt)

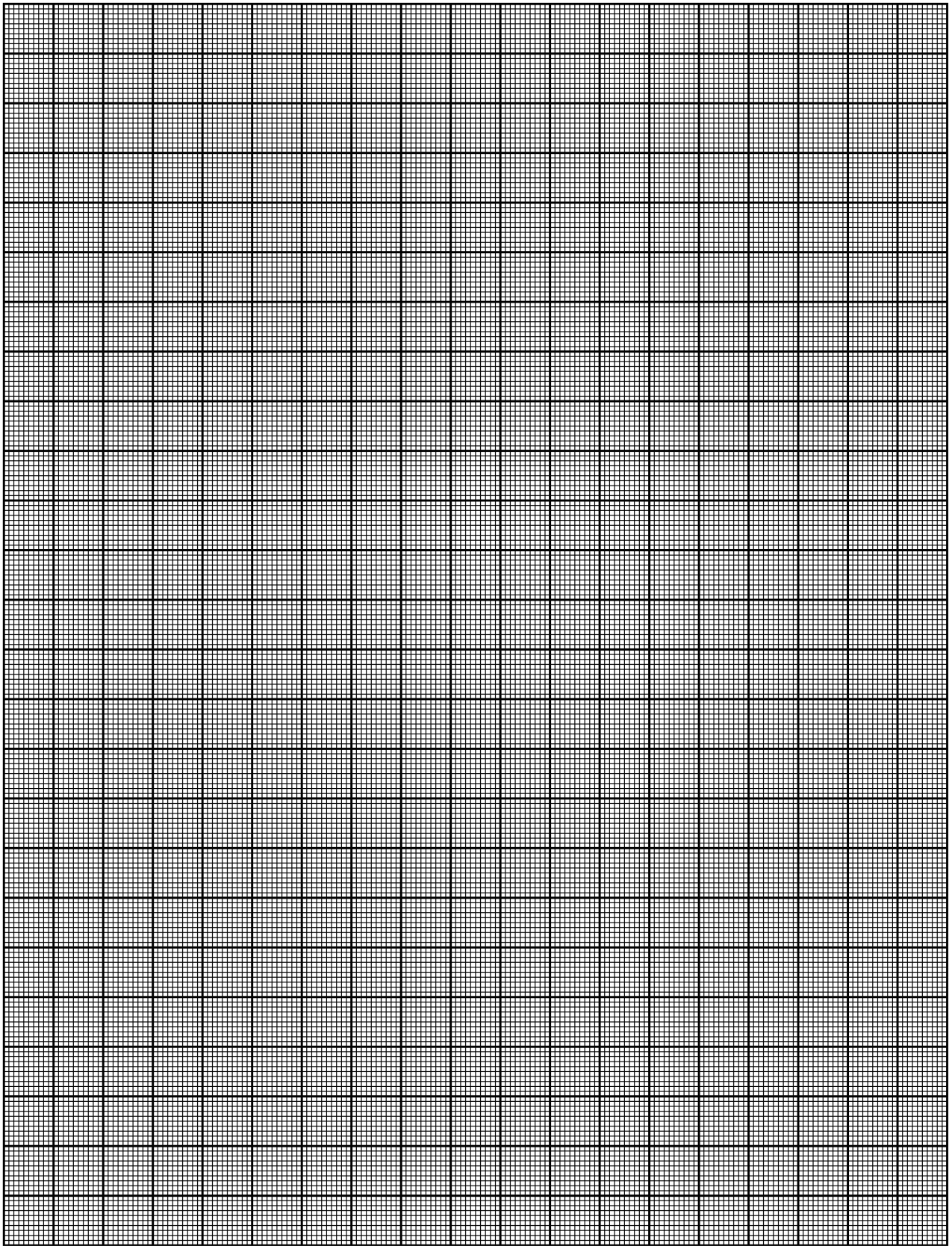
	Copper	Aluminum	Brass
Electrical conductivity			
Heat conductivity			
Lorenz coefficient			

Experiment

ISRAEL 2019

A2-7

English (Official)

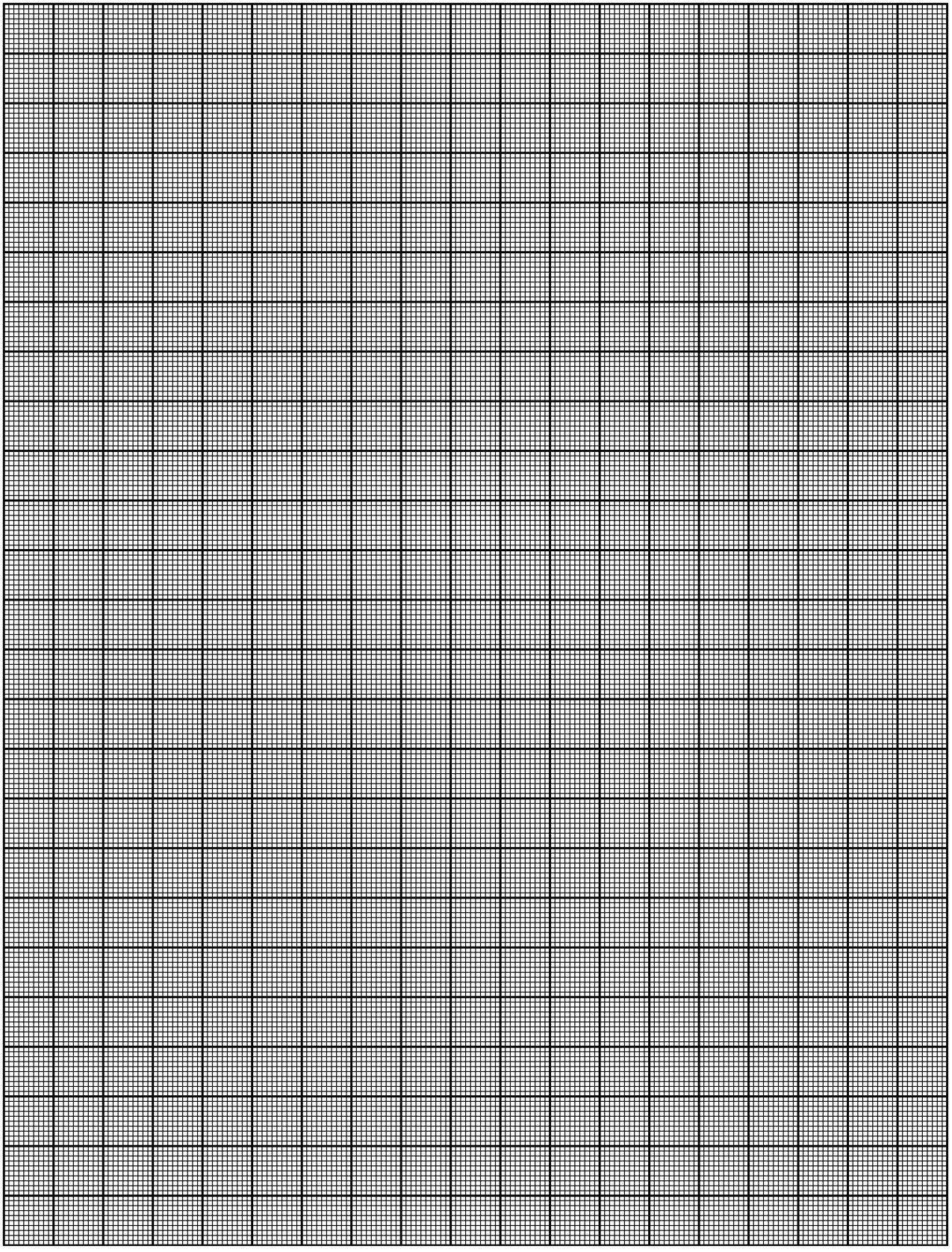


Experiment

ISRAEL 2019

A2-8

English (Official)

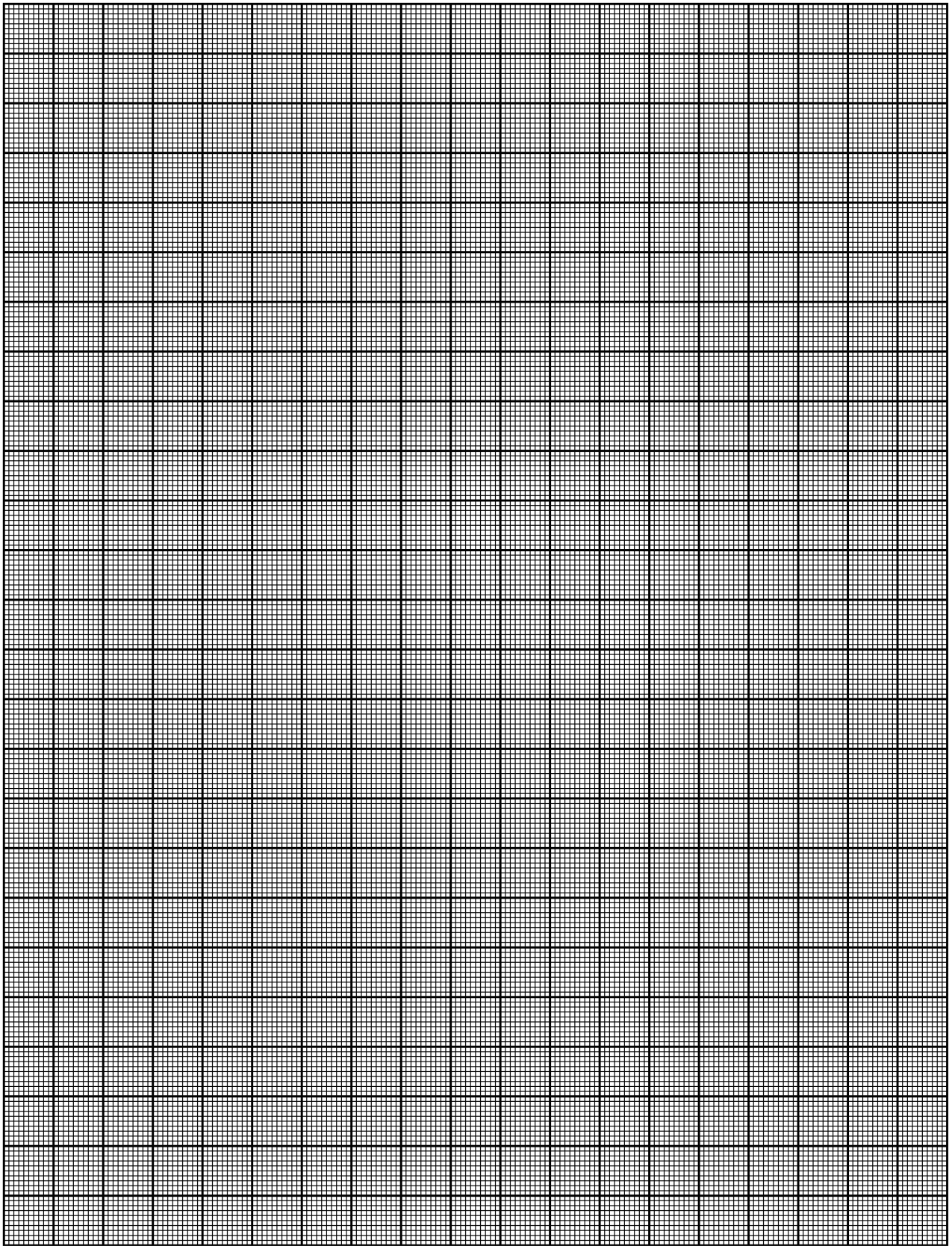


Experiment

ISRAEL 2019

A2-9

English (Official)

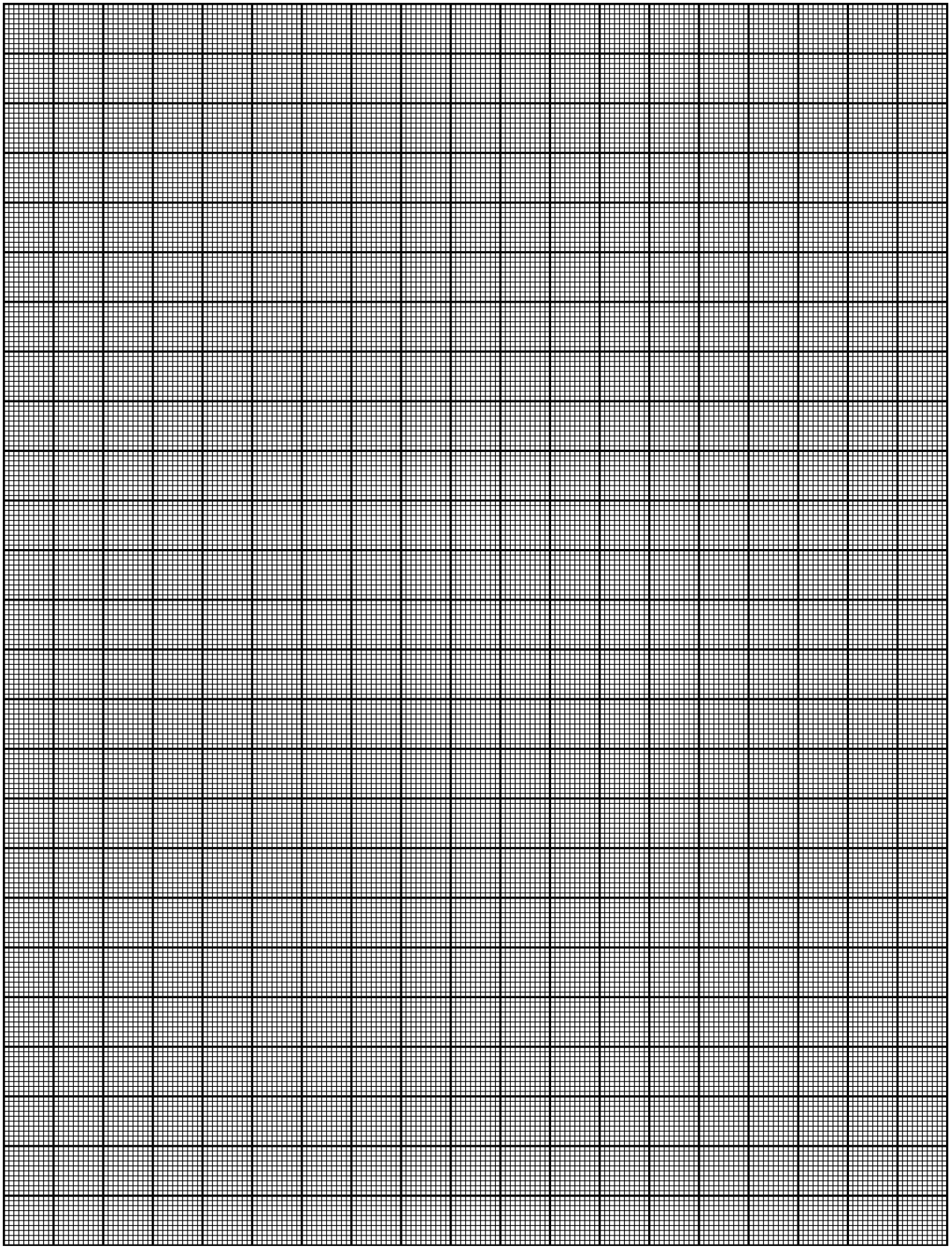


Experiment

IPh ISRAEL 2019 50

A2-10

English (Official)



Experiment

IPhO ISRAEL 2019 50

A2-11

English (Official)