Earth's magnetic field measurement (10 points)

Write down the numbers 0 to 9 in the following table:

0	1	2	3	4	5	6	7	8	9

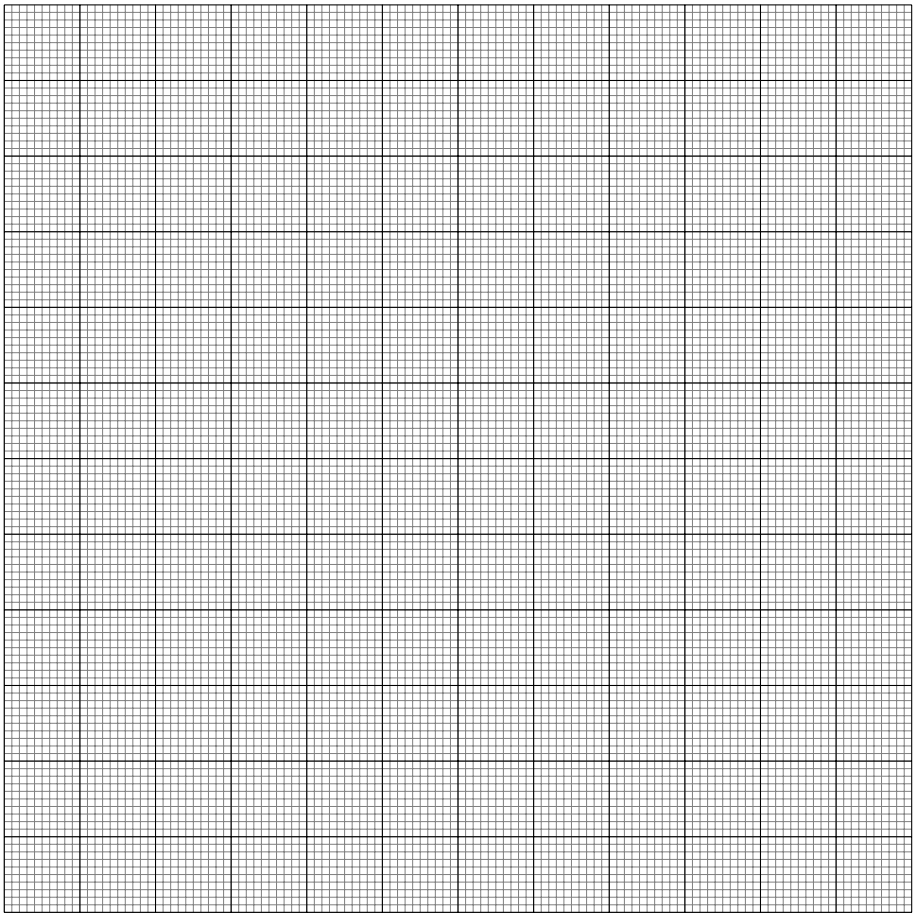
Gouy balance and magnetic moment

A.1 (0.2pt)

$\tau =$

A.2 (0.8pt)

z (mm)													
B_z (mT)													



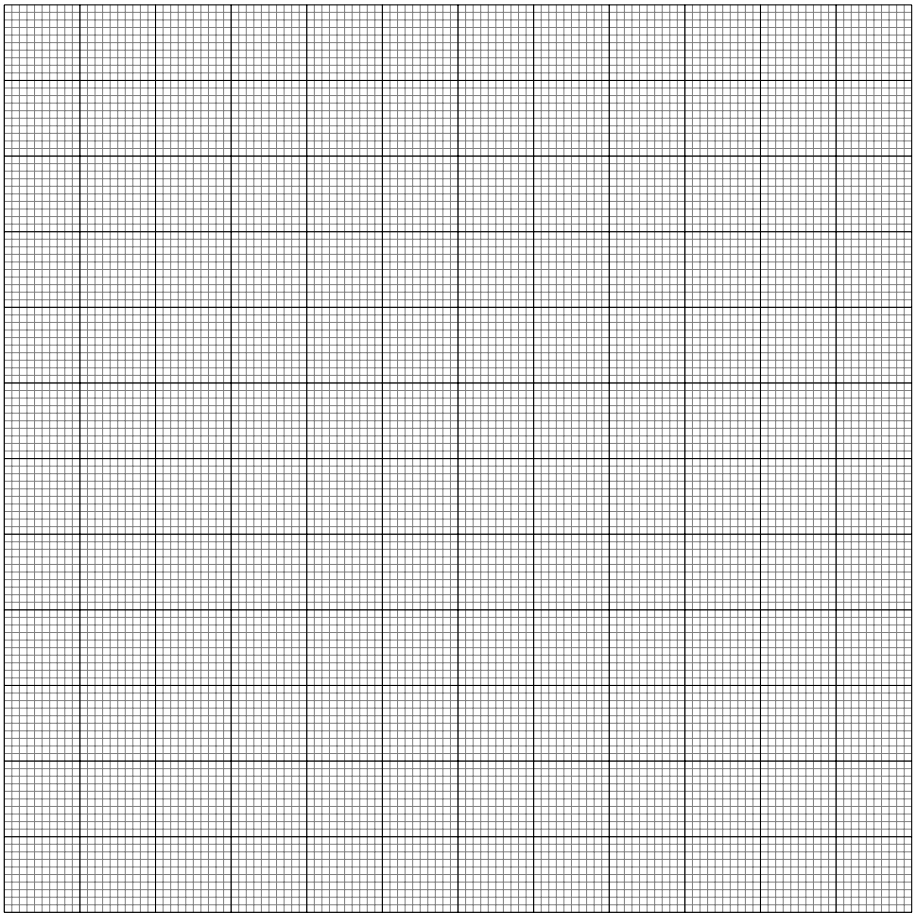
$[z_{min}, z_{max}]$ = mm

A.3 (0.9pt)

$(z_1, z_2) =$ mm

i (A)										
B_{z_1} (mT)										
B_{z_2} (mT)										

Plotted quantities (units):

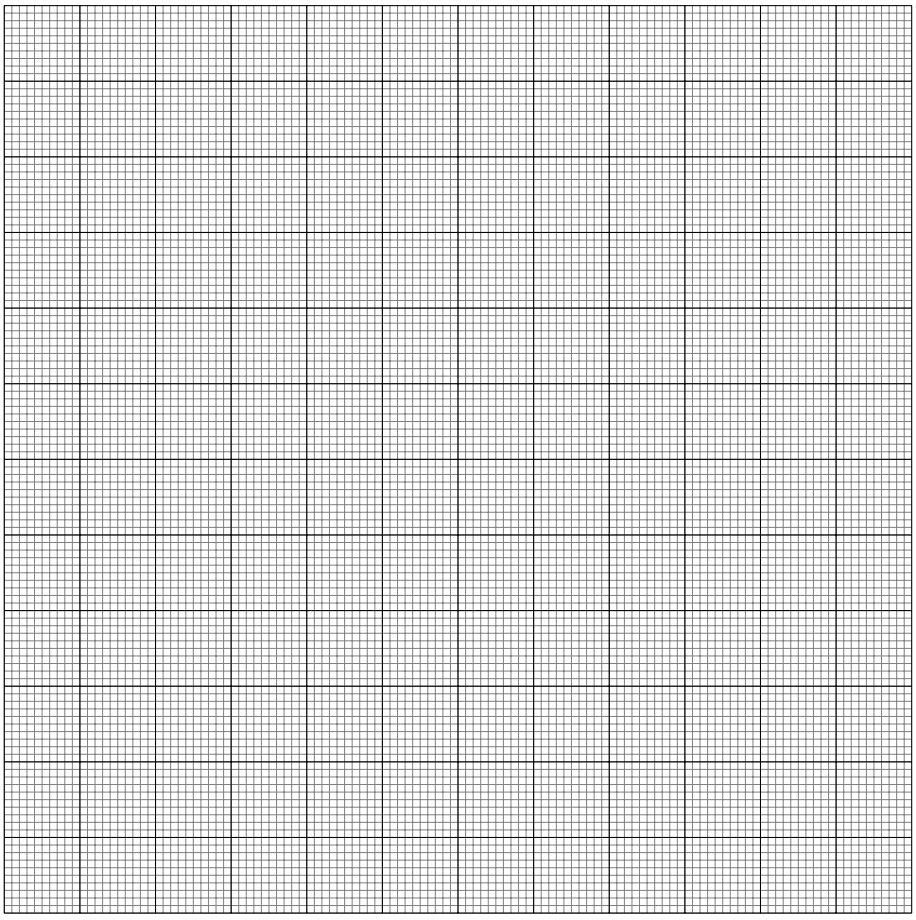


$\alpha =$ $\pm$

A.4 (0.8pt)

i (A)										
m_{f} (g)										

Plotted quantities (units):

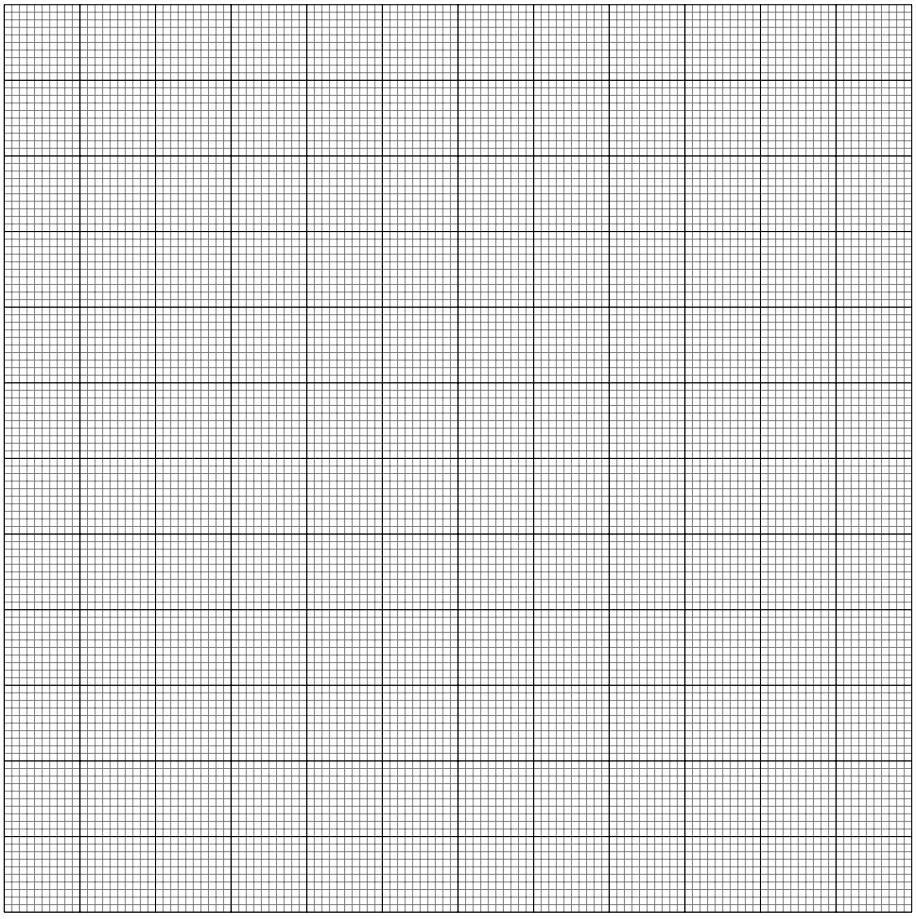


$m_{\mathrm{m}} =$ $\pm$

A.5 (1.3pt)

z (mm)										
B_z (mT)										

Plotted quantities (units):



$m_{\mathrm{m}} =$ $\pm$

A.6 (0.2pt)

$m_{\mathrm{m}} =$ $\pm$

Determining the earth's magnetic field

B.1 (0.3pt)

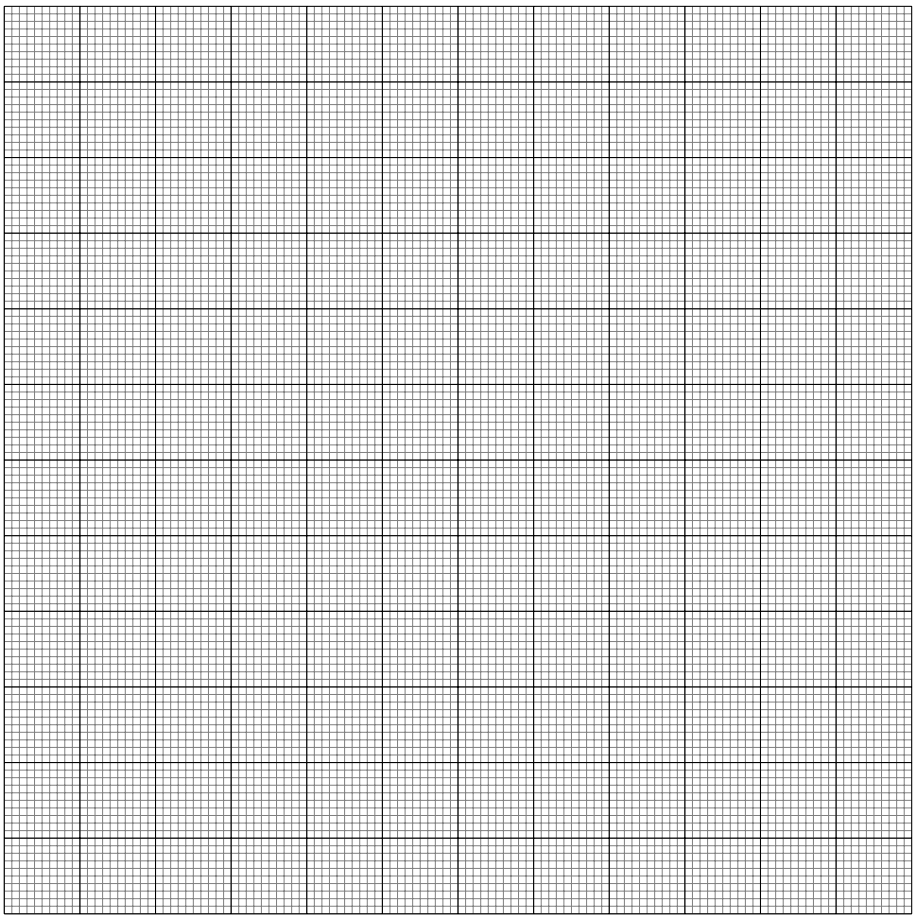
quantity	unit	Fixed (F) / Varying (V)

Equation on quantities:

Schematic:

B.2 (1.1pt)
Measured quantities (units):

Plotted quantities (units):



$B_e =$ $\pm$

B.3 (0.7pt)

Specify the relevant quantity for each measure:

Relevant quantity in measure 1 (unit): Period: $T_1 =$

Relevant quantity in measure 2 (unit): Period: $T_2 =$

Expression of C_f:

$C_\mathrm{f} =$ $\pm$ $\mathrm{N \cdot m^2 \cdot rad^{-1}}$

B.4 (0.3pt)

Expression of L_c:

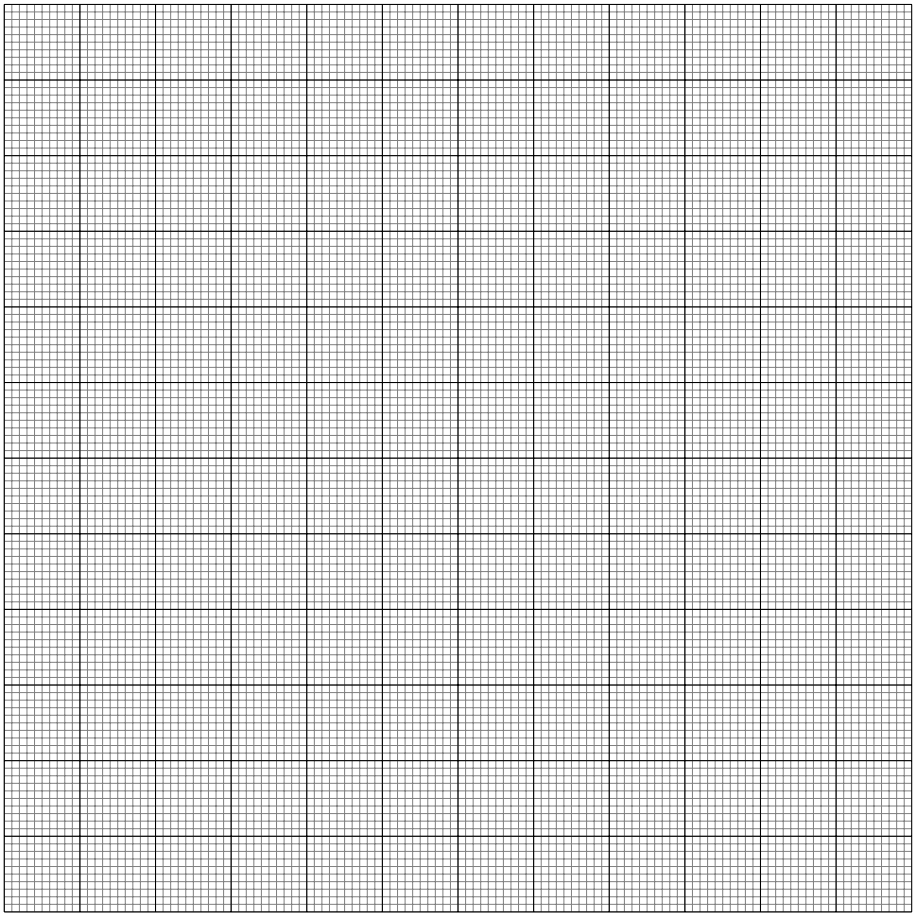
Numerical value $L_\mathrm{c} =$

$(C_\mathrm{f}/L)/(m_\mathrm{m}B_\mathrm{e}) \in$

B.5 (1.1 pt)
Equilibrium 1: $L = 34\,\mathrm{cm}$

θ_0 (rad)										
θ_{eq} (rad)										

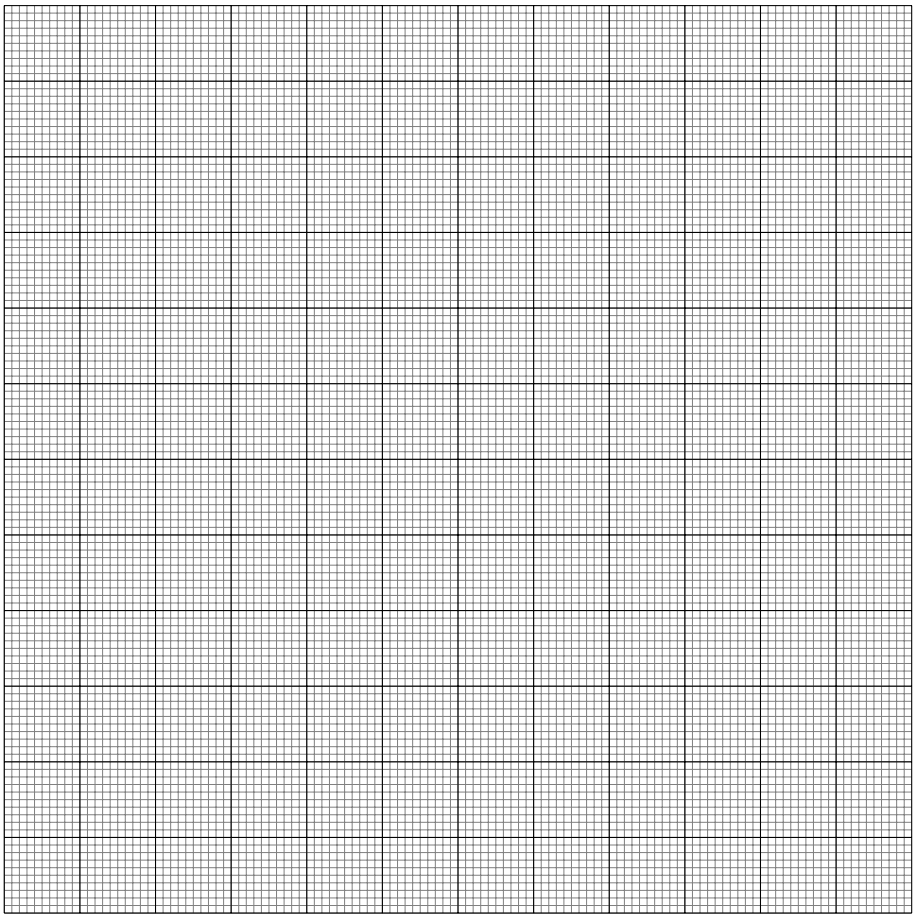
Plotted quantities (units):



$B_{\mathrm{e}} =$ $\pm$

B.6 (2.3pt)
Equilibrium 2: $L =$
Mesured quantities (units):

Plotted quantities (units):

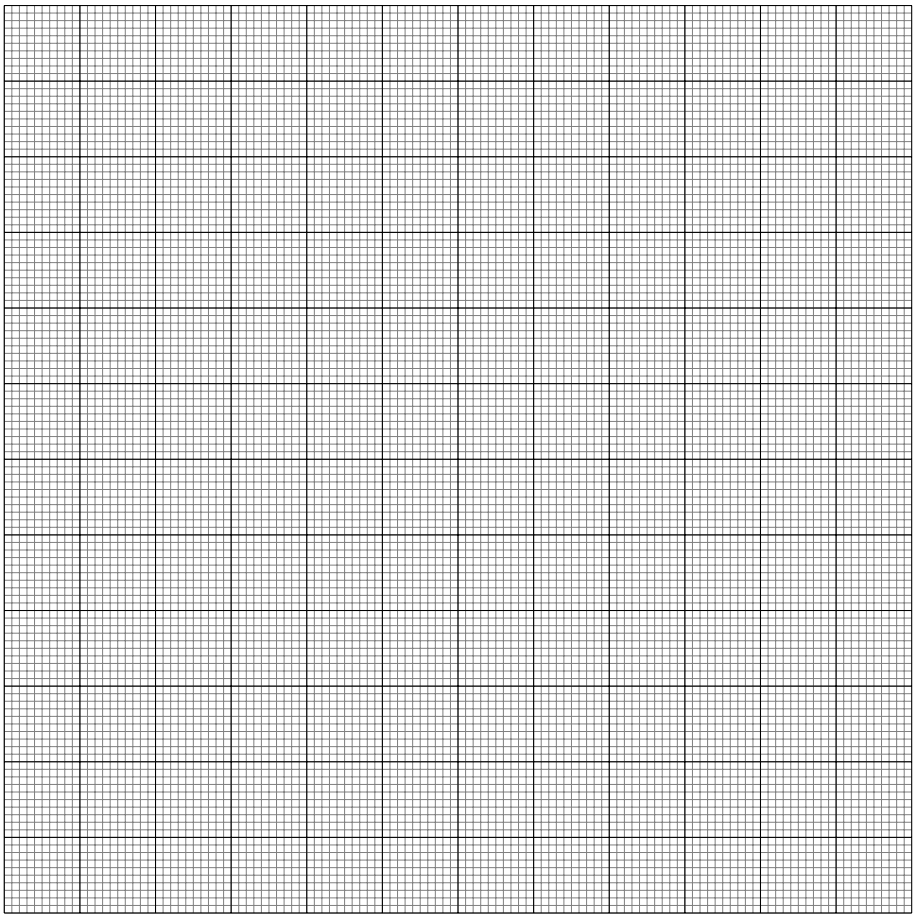


B.6 (cont.)

Equilibrium 3: $L =$

Mesured quantities (units):

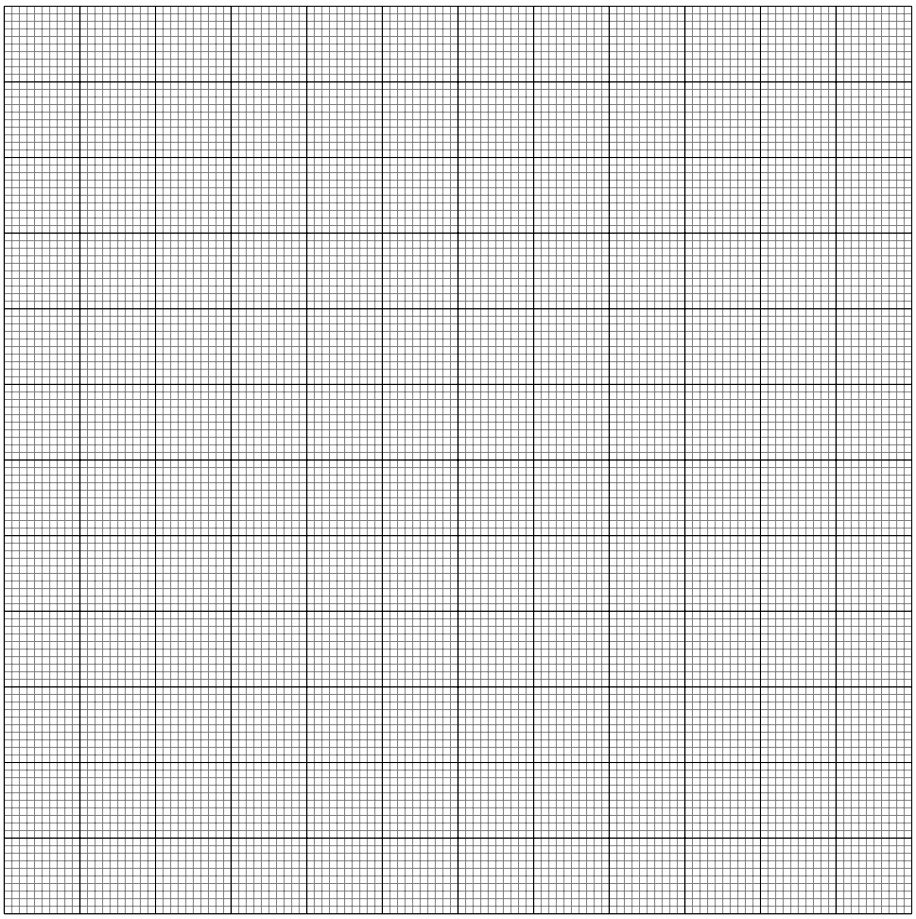
Plotted quantities (units):



B.6 (cont.)

Plotted quantities (units):

	Equilibrium 1	Equilibrium 2	Equilibrium 3



$B_e =$ $\pm$