Unit 02

Exercise 03: Developing and Graphing Linear Equations

Objective: This exercise will guide you in creating and working with two linear equations based on your student ID. You will write the complete formulas, determine the point of intersection, plot the graph, and calculate the area enclosed by the intersection of the lines and the y-axis.

State your user ID: _____

Instructions: Two functions are provided for your use: $y_1 = 10 - b_1x_1$ and $y_2 = 1+b_2x_2$

1) **Task 1**: Use your student ID (e.g., 12345678) to determine the b-coefficients required to write the complete formulas:

   a. To find b_1, repeatedly add the first six digits of your ID until only one digit remains:

   > **Example:** For ID 123456:
   > - add the first six digits: 1 + 2 + 3 + 4 + 5 + 6 = 21
   > - repeat the process for the result (21): 2 + 1 = 3
   > - for the student ID 12345678, the value of $b_1 = 3$

   b. To find b_2 for the second formula, apply the same process to the last **four** digits of your student ID. For example, with the student ID 12345678, $b_2 = 8$

   c. Substitute the values b1 and b2 into the formulas here:

   $y_1 = 10 -$ _____ x_1

   $y_2 = 1 +$ _____ x_2

   These two formulas represent two lines (graphs).

2) **Task 2:** Use the formulas you just derived to find the coordinates where the two lines intersect. This point, known as the equilibrium, is represented as point E with coordinates X_e and Y_e : E (X_e, Ye).

   Record your findings here: two lines intersect in point E with coordinates: E (_____, _____).

3) **Task 3:** Complete the table with the coordinates for both functions, and plot them in the space provided. Ensure the coordinate axes x and y are labeled correctly.

X_1														
Y_1														
X_2														
Y_2														

4) **Task 4:** Finally, calculate the total area enclosed by the intersection of the two lines, the y-axis, and point E.

Total Area A = _____