## 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	vour	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:

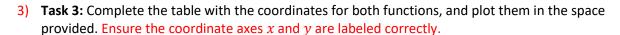
$$y_1 = 10 - x_1$$

$$y_2 = 1 + x_2$$

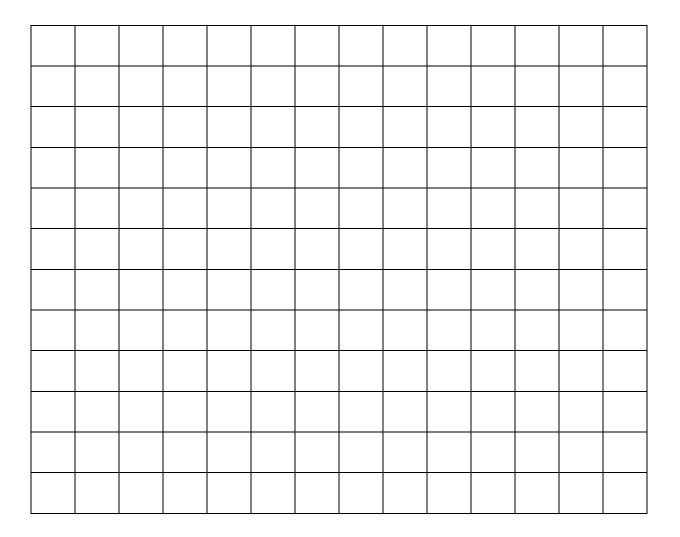
These two formulas represent two lines (graphs).

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 ( $X_e$ ,  $Y_e$ ).

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



X <sub>1</sub>							
Y <sub>1</sub>							
$X_2$							
Y <sub>2</sub>							



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

Total Area A =	