

ESS1001 Basic Mathematics 2021/22

Assignment 2

Answer all the questions. Hand over the assignment to the Department of Economics and Statistics before 4.00 pm on Monday 28 August 2023.

Any submissions after the deadline will not be considered.

1. a. Simplify the inequality $2x + 3 < 4x + 7$
b. Solve the inequality $|5x - 1| \leq 9$, and graph the solution on the number line.
2. a. Write the equation of the straight line in slope-intercept form, and make a graph for the problem, where the slope = 5 and y-intercept = - 2.
b. Find the slope and the y-intercept for the equation, and make a graph for problem, where $y = 2x - 7$.
3. Find the line equation and its y-intercept with slope 5 that contains a point (3, 2).
4. Find the slope of the line that passes through points (2, 7) and (8, 9).
5. Determine the following points are on the graph of the equation $3x + y = 4$.
a. (0, 2)
b. (-2, 10)
6. Determine the size of each matrix and name the type of matrix.
a. $A = \begin{bmatrix} 0 \\ 2 \\ 4 \end{bmatrix}$
b. $B = \begin{bmatrix} 1 & 0 & -1 \\ 3 & 2 & 5 \\ 6 & 4 & 1 \end{bmatrix}$
c. $C = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$

7. Let $S = \begin{bmatrix} 1 & -4 \\ 5 & 3 \end{bmatrix}$ and $T = \begin{bmatrix} 2x & w \\ z-2 & k+1 \end{bmatrix}$ If matrices S and T are equal, find the value of x, w, z, and k.
8. Let $A = \begin{bmatrix} -1 & 3 \\ 1 & 4 \end{bmatrix}$, $B = \begin{bmatrix} 1 & 3 \\ 5 & -2 \end{bmatrix}$, and $C = \begin{bmatrix} 0 & 1 & -3 \\ 4 & 2 & 5 \end{bmatrix}$ Find each of the following products.
- AB
 - AC
 - CA
9. Find the inverse matrix A^{-1} when $A = \begin{bmatrix} 2 & 3 \\ -1 & 4 \end{bmatrix}$.
10. The equilibrium prices P_1 and P_2 for two goods satisfy the equations:
- $$-4P_1 + P_2 = -13$$
- $$2P_1 - 5P_2 = -7$$
- Express this system in matrix form and hence find the values of P_1 and P_2 .