

ECON101 - Maths seminar material - Week 1

Algebra

1. Given the following pair of coordinate points (x, y) , find and sketch the linear equation $y = ax + b$. Where necessary, make sure you enter any rational number as a fraction, and not as a decimal number.

(a) $A = (-2, -1), B = (9, -4)$ [3]

2. Given $A = \begin{pmatrix} 9 & 8 \\ 2 & -5 \end{pmatrix}, B = \begin{pmatrix} -1 & 2 \\ 1 & 1 \end{pmatrix}$, calculate the following matrix operations. Where necessary, make sure you keep any rational number as a fraction, and not as a decimal number.

(a) $A + B$ [1] (b) $2A - 3B$ [1]

(c) $5A + 2B$ [1] (d) AB [3] (e) $|A|$ [2] (f) $|B|$ [2]

(g) A^{-1} [2] (h) B^{-1} [2]

3. Find the values of x which solve the following equations. Note that $x_1 < x_2$ and make sure to enter your answers in square brackets, e.g. $[-5, 3]$.

(a) $-2x^2 + 10x + 9 = 0$ [3] (b) $x^2 + 20x + 11 = 0$ [3]

4. Solve the following pair of equations. Make sure to enter your answers in square brackets, e.g. $[5, -3]$.

(a) $\begin{cases} 16x - 3y = 50 \\ 8x + 2y = 4 \end{cases}$ [2]