Worksheet: Visualization and Solutions of Systems of Equations

Question 1: Polynomial Visualization

Plot the polynomial function
$$f(x) = x^3 - 5x^2 + 2x + 8$$
over the domain $x \in [-5, 5]$.

1. Observe the points where the graph intersects the x-axis.

Question 2: 2D System of Equations

Consider the system of linear equations:
$$3x - y = 4 \quad \text{and} \quad x + 2y = 6$$

1. Plot both equations on the same graph for $x \in [-5, 5]$.

2. Observe the intersection point of the lines.

Question 3: 3D System of Equations

Consider the system of linear equations:

$$x + 2y + z = 7, \quad 2x - y + 3z = 14, \quad 3x + 4y - 2z = 1$$

1. Plot the three planes in 3D space.

2. Observe the intersection of the planes.