Determinants and applications

Cramer's rule

1.

$$3x_1 + 2x_2 = 0$$
$$4x_1 - 5x_2 = 40$$

2. Find the solution for z:

$$2x + 3y - 3z = -1$$
$$4x - 4y - z = 3$$
$$8x - 9z = 0$$

3. Find all solutions depending on parameter $m \in \mathbb{R}$

$$4x_1 + 2x_2 - 2x_3 = 0$$
$$2x_1 + x_2 + 3x_3 = 0$$
$$mx_1 + x_2 + mx_3 = 0$$

4. Find a solution for x_1 depending on parameter $m \in \mathbb{R}$

$$-7x_2 - 5x_3 = -1$$
$$(2m - 1)x_1 - x_2 = 1$$
$$4mx_1 - 7x_2 - 5x_3 = 0$$

5. Find a parameter $p \in \mathbb{R}$ for which the system has non-trivial (not only zero) solution:

$$px + 4y + 7z = 0$$
$$3x - 4y + 5z = 0$$
$$x + py + 4z = 0$$