1.1 SYSTEMS OF LINEAR EQUATIONS

A **linear equation**:

$$a_1 x_1 + a_2 x_2 + \cdots + a_n x_n = b$$

Examples:

$$4x_1 - 5x_2 + 2 = x_1 \quad \text{and} \quad x_2 = 2(\sqrt{6} - x_1) + x_3$$

Not linear:

$$4x_1 - 5x_2 = x_1 x_2 \quad \text{and} \quad x_2 = 2\sqrt{x_1} - 6$$

A **system of linear equations** (or a **linear system**):

A collection of one or more linear equations involving the same set of variables, say, $x_1, \ldots, x_n$.

A **solution** of the system:

A list $(s_1, s_2, \ldots, s_n)$ of numbers that makes each equation in the system a true statement when the values $s_1, \ldots, s_n$ are substituted for $x_1, \ldots, x_n$, respectively.