1. Let \( A = \begin{pmatrix} 2 & 6 \\ 0 & 2 \end{pmatrix} \), and let \( U \) be the unit square \( \{(x,y) : 0 \leq x \leq 1 \text{ and } 0 \leq y \leq 1\} \) in \( \mathbb{R}^2 \). Let \( U' \) be the image under \( A \) of \( U \). Find the area of \( U \).

2. Find the distance from the line \((4 + t, -1 - 2t, 3 - 7t)\) to the plane \(3x - 2y + z = 3\).

3. Let \( A = \begin{pmatrix} 2 & -3 \\ 1 & 4 \end{pmatrix} \) and \( B = \begin{pmatrix} 1 & -2 \\ 5 & 0 \end{pmatrix} \). Find \( AB - BA \).
4. Consider the function \( f(x, y, z) = (x^2 + y^2)/\sin(z) \). Describe the level surfaces for different values. What coordinate system is best suited for this?

5. We say that a function \( f: \mathbb{R}^m \to \mathbb{R}^n \) is linear if \( f(\lambda x + \mu y) = \lambda f(x) + \mu f(y) \). Characterize all linear functions from \( \mathbb{R} \) to \( \mathbb{R} \). Is \( f(x) = 7x - 4 \) linear, according to this definition?