Sure, I can explain the step-by-step process to find the various norms of a given matrix/vector along with an example.

Let's start by defining what a norm is. In linear algebra, a norm is a function that assigns a positive value to a vector or matrix that satisfies certain properties. Some of the commonly used norms in linear algebra include the Euclidean norm, the Manhattan norm, and the maximum norm.

Here are the steps to find the various norms of a given matrix/vector:

Step 1: Determine the type of norm you want to calculate. The most commonly used norms are the Euclidean norm, the Manhattan norm, and the maximum norm.

Step 2: If you are working with a matrix, determine the size of the matrix. The size of a matrix is given by the number of rows and columns.

Step 3: If you are working with a vector, determine the dimension of the vector. The dimension of a vector is given by the number of entries.

Step 4: Calculate the norm using the appropriate formula. Here are the formulas for the three most commonly used norms:

- Euclidean norm: ||x||_2 = sqrt(x_1^2 + x_2^2 + ... + x_n^2), where x = [x_1, x_2, ..., x_n]
- Manhattan norm: ||x||_1 = |x_1| + |x_2| + ... + |x_n|
- Maximum norm: ||x||_inf = max(|x_1|, |x_2|, ..., |x_n|)

Step 5: Plug in the values of the matrix/vector into the appropriate formula and calculate the norm.

Here is an example of finding the various norms of a vector:

Let's say we have the vector x = [3, -4, 5, -6].

To find the Euclidean norm, we use the formula:

$||x||_2 = \sqrt{x_1^2 + x_2^2 + x_3^2 + x_4^2}$

Plugging in the values of x, we get:

$||x||_2 = \sqrt{3^2 + (-4)^2 + 5^2 + (-6)^2} = \sqrt{86} = 9.2736$

To find the Manhattan norm, we use the formula:

$||x||_1 = |x_1| + |x_2| + |x_3| + |x_4|$

Plugging in the values of x, we get:

$||x||_1 = |3| + |-4| + |5| + |-6| = 18$

To find the maximum norm, we use the formula:

$||x||_{inf} = \max(|x_1|, |x_2|, |x_3|, |x_4|)$

Plugging in the values of x, we get:

$||x||_{inf} = \max(|3|, |-4|, |5|, |-6|) = 6$

So the Euclidean norm of x is 9.2736, the Manhattan norm of x is 18, and the maximum norm of x is 6.