

0.1 Norms

We can use norms to denote the “length” of a single vector.

$$||v|| = \sqrt{\langle v, v \rangle}$$

$$||v|| = \sqrt{v^* M v}$$

0.1.1 Euclidian norm

If $M = I$ we have the Euclidian norm.

$$||v|| = \sqrt{v^* v}$$

If we are using the real field this is:

$$||v|| = \sqrt{\sum_{i=1}^n v_i^2}$$

0.1.2 Pythagoras' theorem

If $n = 2$ we have in the real field we have:

$$||v|| = \sqrt{v_1^2 + v_2^2}$$

We call the two inputs x and y , and the length z .

$$z = \sqrt{x^2 + y^2}$$

$$z^2 = x^2 + y^2$$