

Triangle Equality

1 Why

The squared norm of a sum of orthogonal vectors is the sum of their squared norms.

2 Result

Proposition 1. Let (V, F) be an inner product space with induced norm $|\cdot|$. Let $x, y \in V$ be orthogonal vector. Then

$$|x + y|^2 = |x|^2 + |y|^2$$
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