

## ABSTRAK

### SUDUT- $g$ ANTARA GARIS DAN SUBRUANG DAN ANTARA DUA BIDANG DI RUANG BERNORMA- $n$

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Disertasi ini membahas tentang sudut antara dua subruang di ruang hasil kali dalam dan ruang bernorma serta perumumannya di ruang hasil kali dalam- $n$  dan ruang bernorma- $n$  untuk  $n \geq 2$ . Pada pembahasan sudut di ruang bernorma, dirumuskan sudut- $g$  dan sudut- $gg$  antara dua vektor beserta hubungan diantara keduanya. Setelah itu dirumuskan sudut- $g$  antara subruang berdimensi satu dan sembarang. Pada bagian ini dibahas pula sudut- $g$  antara dua subruang berdimensi dua.

Bagian selanjutnya dalam disertasi ini membahas sudut antara dua subruang di ruang hasil kali dalam- $n$  dan ruang bernorma- $n$  untuk  $n \geq 2$ . Metode yang digunakan adalah memanfaatkan hasil kali dalam baru yang diturunkan dari hasil kali dalam- $n$  dan sudut di ruang hasil kali dalam. Demikian pula, dengan menggunakan norma yang diturunkan dari norma- $n$  dan sudut- $g$  di ruang bernorma, dikaji sudut- $g$  di ruang bernorma- $n$ .

**Kata Kunci:** *vektor, subruang, ruang hasil kali dalam, ruang bernorma, ruang hasil kali dalam- $n$ , ruang bernorma- $n$ , sudut- $g$ , sudut- $gg$ .*

## **ABSTRACT**

### ***g*-ANGLE BETWEEN A LINE AND A SUBSPACE AND BETWEEN TWO PLANES IN AN $n$ -NORMED SPACE**

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*This dissertation discusses the angle between two subspaces in an inner product space and in a normed space, and its generalization in an  $n$ -inner product space and in an  $n$ -normed space for  $n \geq 2$ . In the discussion of angle in a normed space, it is formulated the  $g$ -angle and the  $gg$ -angle between two vectors and their connection. Moreover, we formulate the  $g$ -angle between a 1-dimensional subspace and arbitrary dimensional subspaces. In this section, we also discuss the  $g$ -angle between 2-dimensional subspaces.*

*The next section of this dissertation discusses the angle in an  $n$ -inner product space and the angle in an  $n$ -normed space for  $n \geq 2$ . The method used is utilizing the result of a new inner product derived from an  $n$ -inner product and the angle in an inner product space. Likewise, using a new norm that is derived from an  $n$ -norm and the  $g$ -angle in a normed space, we study the  $g$ -angle in an  $n$ -normed space.*

**Keywords:** *vectors, subspaces, inner product spaces, normed spaces,  $n$ -inner product spaces,  $n$ -normed spaces  $g$ -angles,  $gg$ -angles.*