



Zoom Meeting | File | C:\Users\Weksa\Desktop\za\_slagjana\_za\_prevod\_trud\_2\_granka\_2\_podprostor/teorem\_of\_jhan\_banach\_of\_the\_cyclic\_2\_subspaces.pdf

6 | of 7

Subcase 3.3.  $u = x_i, v = x_{i+k}$  for some  $k > 2$ , where without loss of generality we can assume that  $i | k < n$ . If  $i | k > n$ , then we consider it that  $i | k = p, p < i - 1$  where  $i - k \equiv p \pmod n$ .

In this case we have formed one cyclic 2-subspace, i.e. two cyclic 2-subspaces (see drawing). Unless in the case  $n = 4$ , i.e. when the number of generating elements of a 2-subspace  $M$  is four elements, two subspaces that are nuclear can never be obtained. But in any case, it is best to look at the drawing in which a cyclic 2-subspace is given, which is generated by five elements.

Subcase 3.4.  $u = x_i, v \in L(x_j, x_{j+1}, \dots, x_k)$ , where  $k \geq j + 2$ , and if  $k > n$  we will consider it that  $k = p$  where  $k \equiv p \pmod n$  for some  $p \in \{1, 2, 3, \dots, n\}, p < i - 1$ .

3.4.1.  $v \in L(x_j, x_k)$ . In this situation  $v = \alpha x_j + \beta x_k, \alpha, \beta \neq 0$

3.4.2.  $v \notin L(x_j, x_k)$ . In this situation  $v = \alpha x_j + \alpha_1 x_{j+1} + \dots + \alpha_{k-j} x_{j+k-1} + \beta x_k$  where  $\alpha, \beta = 0$  and at least one of the scalars  $\alpha_1, \alpha_2, \dots, \alpha_{k-j}$  is not zero.

The opposite case when  $v = x_i, u \in L(x_j, x_{j+1}, \dots, x_k)$  is analogously considered.

Subcase 3.5.  $u \in L(x_j, x_{j+1}, \dots, x_k)$  and  $v \in L(x_i, x_{i+1}, \dots, x_n)$ . The discussion for  $j, k, i$  and  $i$  is the same as in the case 3.4. We have

