№2

$$-u'' + 10u = 1 \qquad u'(0) = u'(1) = 0$$

$\text{dom}(A) = U = \{ u \mid u \in C^2[0,1], u'(0) = u'(1) = 0 \}$

$F = L_2(0,1)$

$F_n = \mathbb{R}^n$

$H_A = \{ u \mid u'(0) = u'(1) = 0, u' \in L_2(0,1) \}$

$U_n = \langle v_1, \ldots, v_n \rangle \subset H_A : u_n = \sum_1^n c_k v_k$

$A : U \to L^2(0,1) \; ; \; A : u \to -u'' + 10u$

$\varphi_n : H_A \to U_n \; ; \; \varphi_n u_n = (c_1, \ldots, c_n) = \bar{u}_n$

$\overline{\varphi_n} : \mathbb{R}^n \to L^2(0,1) ; \qquad \overline{\varphi_n} \bar{u}_n = \sum_1^n c_k v_k$

$\psi_n : L^2(0,1) \to \mathbb{R}^n$

$\psi_n f = ((f, v_1), \ldots, (f, v_n))$

$A_n : U_n \to \mathbb{R}^n, \; A_n \bar{u}_n = \psi_n f, \; \text{где} \; A_n = ([v_i, v_j])_{i,j=1}^n$