

Math 200: Linear Algebra  
Section 5.4: Extra Problems

27. Let  $V$  be  $\mathbb{R}^n$  with a basis  $\mathcal{B} = \{\mathbf{b}_1, \dots, \mathbf{b}_n\}$ ; let  $W$  be  $\mathbb{R}^n$  with the standard basis, denoted here by  $\mathcal{E}$ ; and consider the identity transformation  $I : V \rightarrow W$ , where  $I(\mathbf{x}) = \mathbf{x}$ . Find the matrix for  $I$  relative to  $\mathcal{B}$  and  $\mathcal{E}$ . What was this matrix called in Section 4.4?
28. Let  $V$  be a vector space with a basis  $\mathcal{B} = \{\mathbf{b}_1, \dots, \mathbf{b}_n\}$ ,  $W$  be the same space as  $V$  with a basis  $\mathcal{C} = \{\mathbf{c}_1, \dots, \mathbf{c}_n\}$ , and  $I$  be the identity transformation  $I : V \rightarrow W$ . Find the matrix for  $I$  relative to  $\mathcal{B}$  and  $\mathcal{C}$ . What was this matrix called in Section 4.7? (Cross out "Section 4.7" and replace it with "Section 4.6")
29. Let  $V$  be a vector space with a basis  $\mathcal{B} = \{\mathbf{b}_1, \dots, \mathbf{b}_n\}$ . Find the  $\mathcal{B}$ -matrix for the identity transformation  $I : V \rightarrow V$ .