

MATH 5010 - SPRING 2023 (PROF. KINSER) - QUIZ 4

1. (3 points) Let  $V^* = \text{Hom}_F(V, F)$  be the space of linear transformations from the finite dimensional vector space  $V$  to a field  $F$ , known as the *dual space* of  $V$ . use the basis of  $V$ ,  $\{v_1, v_2, \dots, v_n\}$ , to define a basis for  $V^*$ .
2. (2 points) Let  $R$  be a ring and  $M$  a left  $R$ -module. Define what it means for  $M$  to be a *Noetherian  $R$ -module*.