

$$= (-t) (-1)^{k-1} (a_1 + a_2 t + \dots + a_{k-1} t^{k-2} + t^{k-1}) \quad (16)$$

└ using the induction hypothesis ┘

$$+ (-1)^k a_0 \cdot 1$$

$$= (-1)^k (a_0 + a_1 t + a_2 t^2 + \dots + a_{k-1} t^{k-1} + t^k).$$

By induction, we are done. □

Thinking about  $T$ -invariant subspaces can help in computing the characteristic polynomial of  $T$ :

Theorem (5.21) Let  $V$  be a finite-dim. vector space,  $T: V \rightarrow V$  a linear map and  $W$  a  $T$ -invariant subspace of  $V$ . Let  $f(t)$  be the characteristic polynomial of  $T$  and  $g(t)$  be the characteristic polynomial of the restriction  $T|_W$  of