3 Exercise. Suppose V is finite dimensional and U is a subspace of V. Show that $U = V$ if and only if $U^0 = \{0\}$

- Suppose $U = V$

  By 3.106, $\dim U^0 = \dim V - \dim U$

  $= 0$ ✓

- Suppose $U^0 = \{0\}$

  $\dim U^0 = 0$

  By 3.106, $\dim V = \dim U$

  Since U is a subspace of V, $U = V$ ✓