Proof of Prop. 13

Suppose $B = \{\bar{v}_1, \ldots, \bar{v}_p\}$ and
$C = \{\bar{w}_1, \ldots, \bar{w}_q\}$ are two bases of V.

Since, B is li & C is a spanning set for V,

$p \leq q$ ① (By Prop. 12)

Also, C is li & B is a spanning set for V

$q \leq p$ ② (By prop. 12)

From ① & ②, $p = q$.

H.P