Given $v_1, \dots, v_k \in V$

$$\theta_1 \wedge \theta_2 (v_1, v_2)$$

$$\propto \mathrm{Alt}(\theta_1 \otimes \theta_2)(v_1, v_2)$$

$$= \sum_{\sigma \in S(2)} \varepsilon_\sigma \theta_1(v_{\sigma(1)}) \theta_2(v_{\sigma(2)})$$

why is $|\Lambda^r(k)| = \binom{N}{r}$?

and why are the basis elements indep?