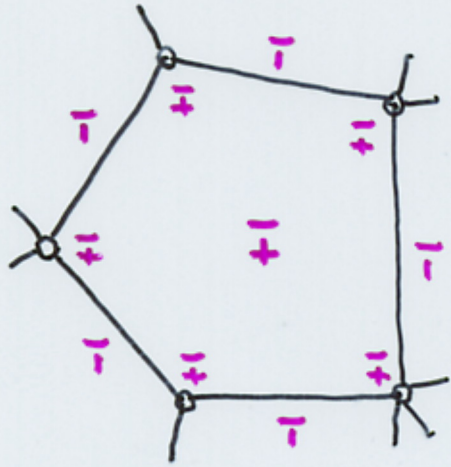
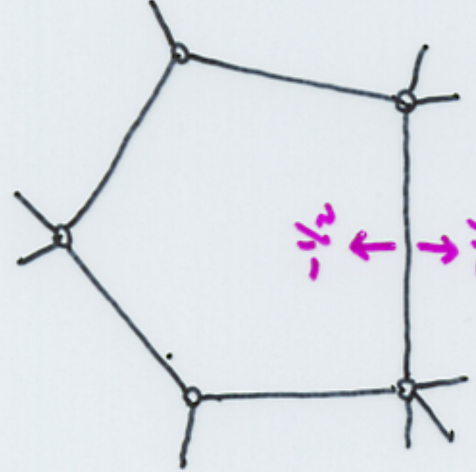


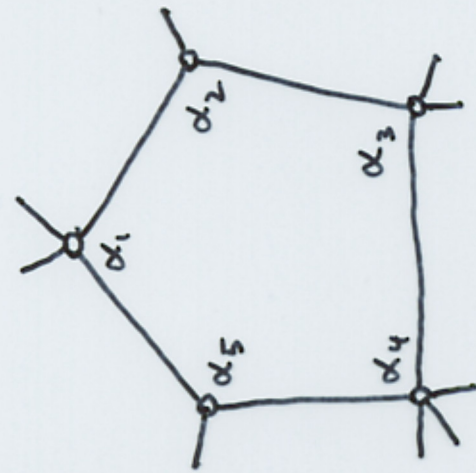
DESCARTES THEOREM IS EQUIVALENT TO EULER'S FORMULA



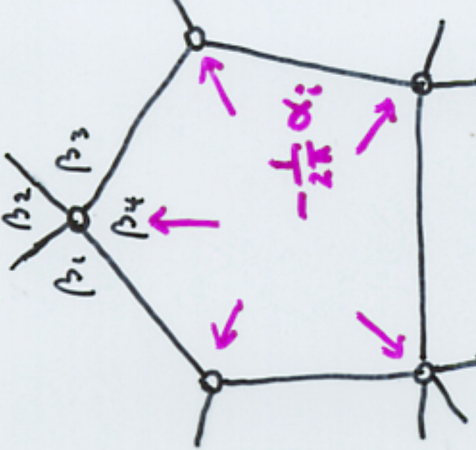
$$c_0$$



$$c(F) = 1 - \frac{1}{2} d(F)$$



$$\sum \alpha_i = -2\pi c(F)$$



$$c^*(v) = 1 - \sum_{i=1}^{d(v)} \frac{\beta_i}{2\pi}$$

$$c^*(v) = \frac{1}{2\pi} \sum \kappa(v)$$

$$\sum_{x \in V \cup E \cup F} c_0(x) = \chi(\mathcal{F}) \Leftrightarrow \sum_{v \in V} c^*(v) = \frac{1}{2\pi} \sum_{v \in V} \kappa(v) = \chi(\mathcal{F})$$