$$\underline{\Omega} = \{ \underset{=}{o_1}, \underset{=}{o_2}, \ldots \}$$

$$0 \le p \le 1 \quad \{1, 2, 3, 4, 5, 6\}$$

$$p(o_1) = p_1$$

$$p(o_2) = p_2$$

$$\vdots$$

$$\sum_{o_i \in \Omega} p_i = 1$$

$$\Omega = \{o_1, o_2, \ldots o_n\}$$

$$S \subseteq \Omega$$

$$p(S) = \sum_{o_i \in S} p(o_i)$$

$$\underline{\underline{A}} \qquad \underline{\underline{B}}$$

$$\underline{P(A \cap B) = P(A) \cdot P(B)}$$

$$\underline{P(A \cup B) \leq P(A) + P(B)}$$

$$|V| = n$$

$$e \longrightarrow \underbrace{\Omega_e}_{} = \{ 1_e, 0_e \}$$

$$P_e(1_e) = p$$

$$P_e(0_e) = 1 - p = q$$

V

$e_1, e_2, e_3, \dots\dots, e_{\binom{n}{2}}$

$e_1 \to 0/1 \qquad e_2 \to 0/1$

$e_i \Rightarrow \Omega_{e_i}$

$G(n,p) \to \Omega = \prod_{e \in [V]^2} \Omega_e$

$$\begin{matrix} 0 & 1 & 0 & 0 & 0 & 1 & 0 & 1 & 0 & 1 & \dots \\ q & p & q & q & q & p & q & p & \dots \end{matrix} = \omega$$

$$\boxed{p^m q^{\binom{n}{2} - m}}$$

In

$G(n, p)$

$q = 1 - p$

"e"

$$G \in \mathcal{G}(n, p)$$

$$A_e = \{\omega \mid \omega(e) = 1\} \checkmark$$

$$\underbrace{P(A_e) = p}\cdot\underbrace{1 \cdot 1}$$

n

"k"

$\binom{k}{2}$

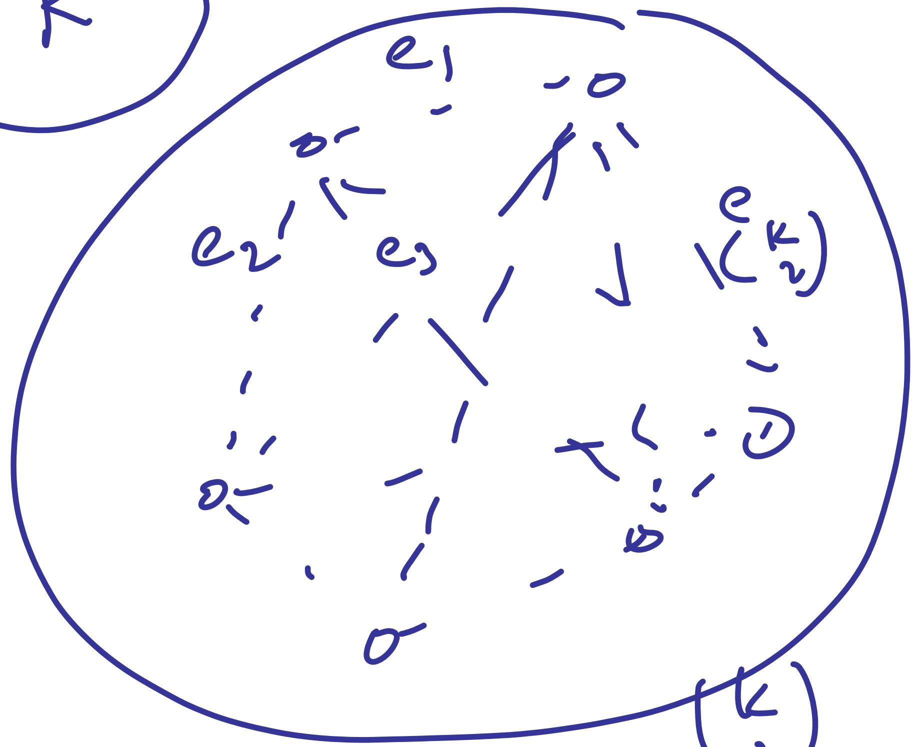
$\bar{A}_{e_1}$

$$P\Big(\underbrace{e_1 \text{ is not prent}} \text{ AND}$$

$$\underbrace{e_2 \text{ is not pren}} \text{ AND}$$

$$\vdots$$

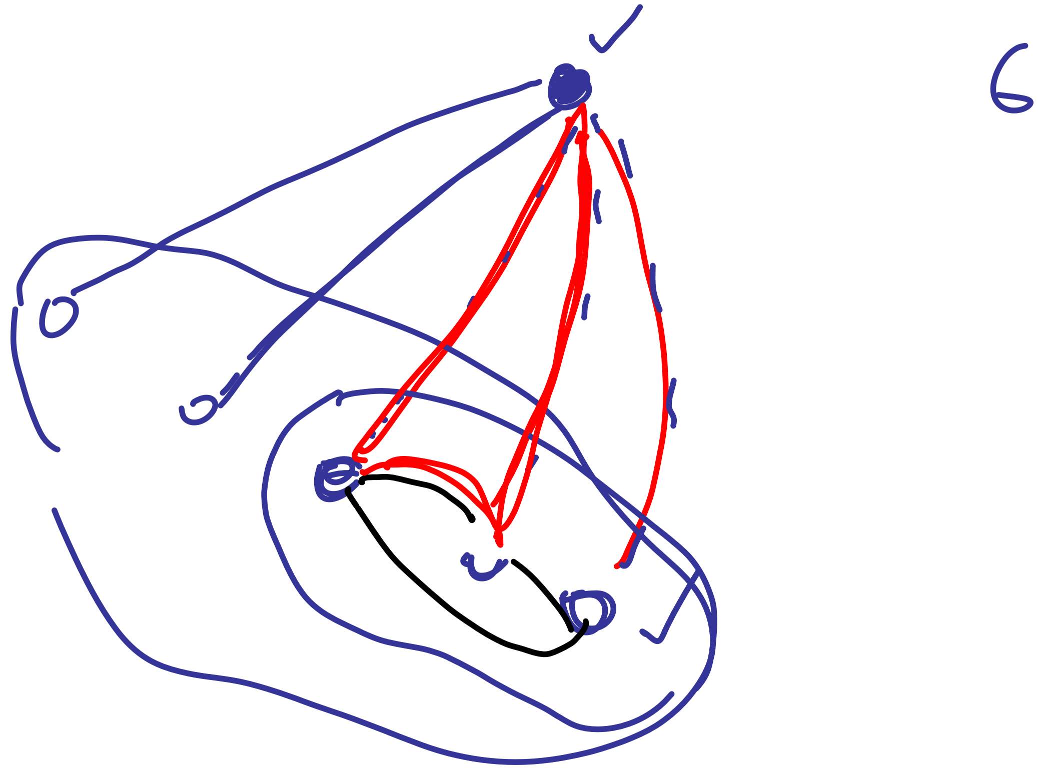
$$\underbrace{e_{\binom{k}{2}}} \text{ is not parent} \Big) = q \cdot q \cdot q \cdots = q^{\binom{k}{2}}$$

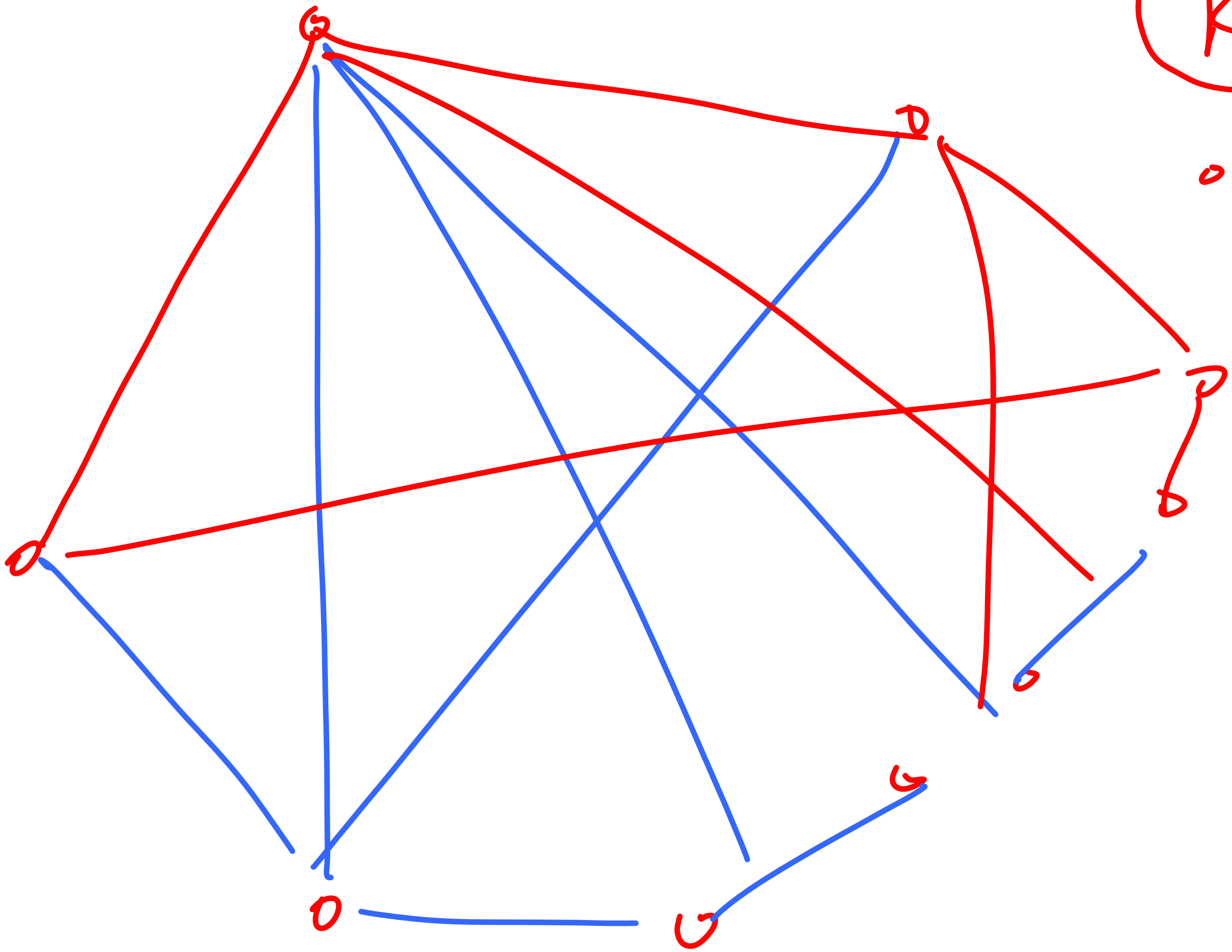


$$\underbrace{\Pr\left(\text{There exist } k \text{ vertices forming an independent set}\right) \le \binom{n}{k} q^{\binom{k}{2}}}$$

$$\le \binom{n}{k} p^{\binom{k}{2}}$$

✓

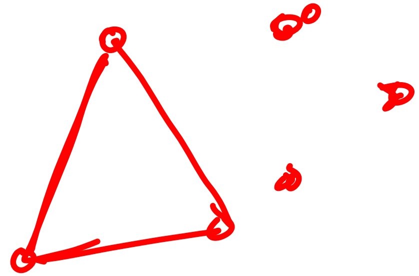




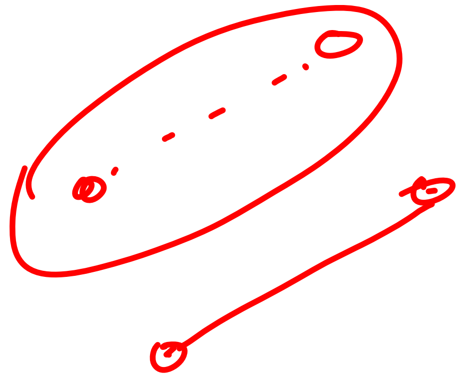
K_r

or $\overline{K_r}$

$R(r)$ $\quad$ $n(r)$



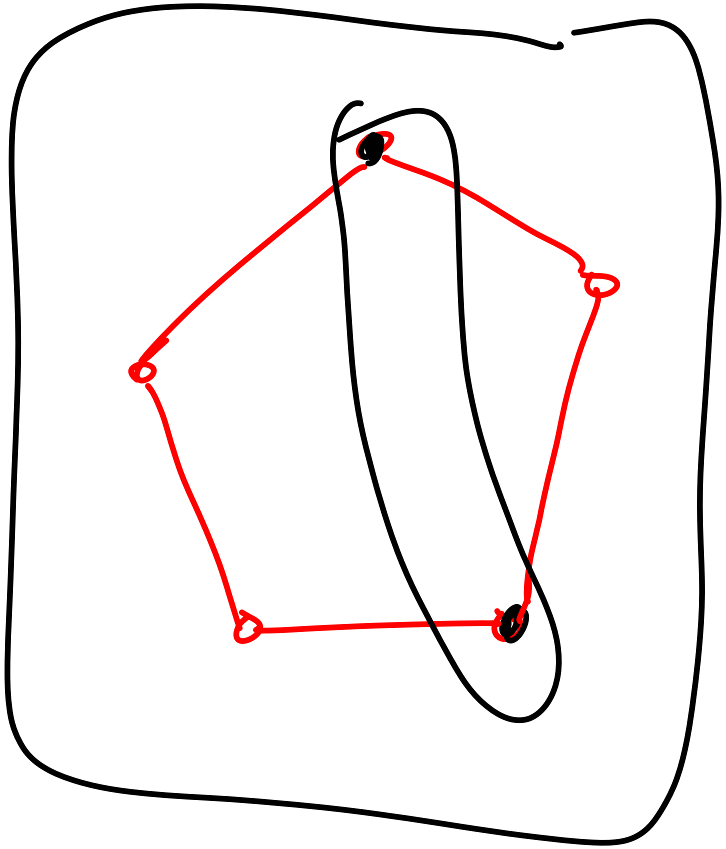
$R(1) = 1$ ✓

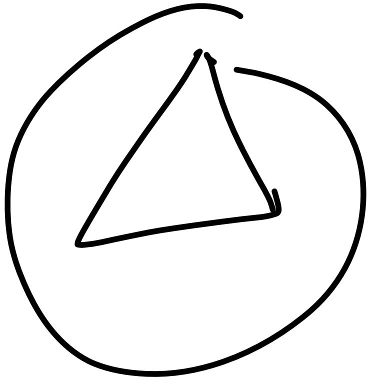


$R(2) = 2$

$R(3) = 6$ ✓

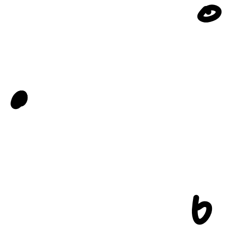
$\underline{R(3) = 6}$





K_3 ✓

$\overline{K_3}$ ✓

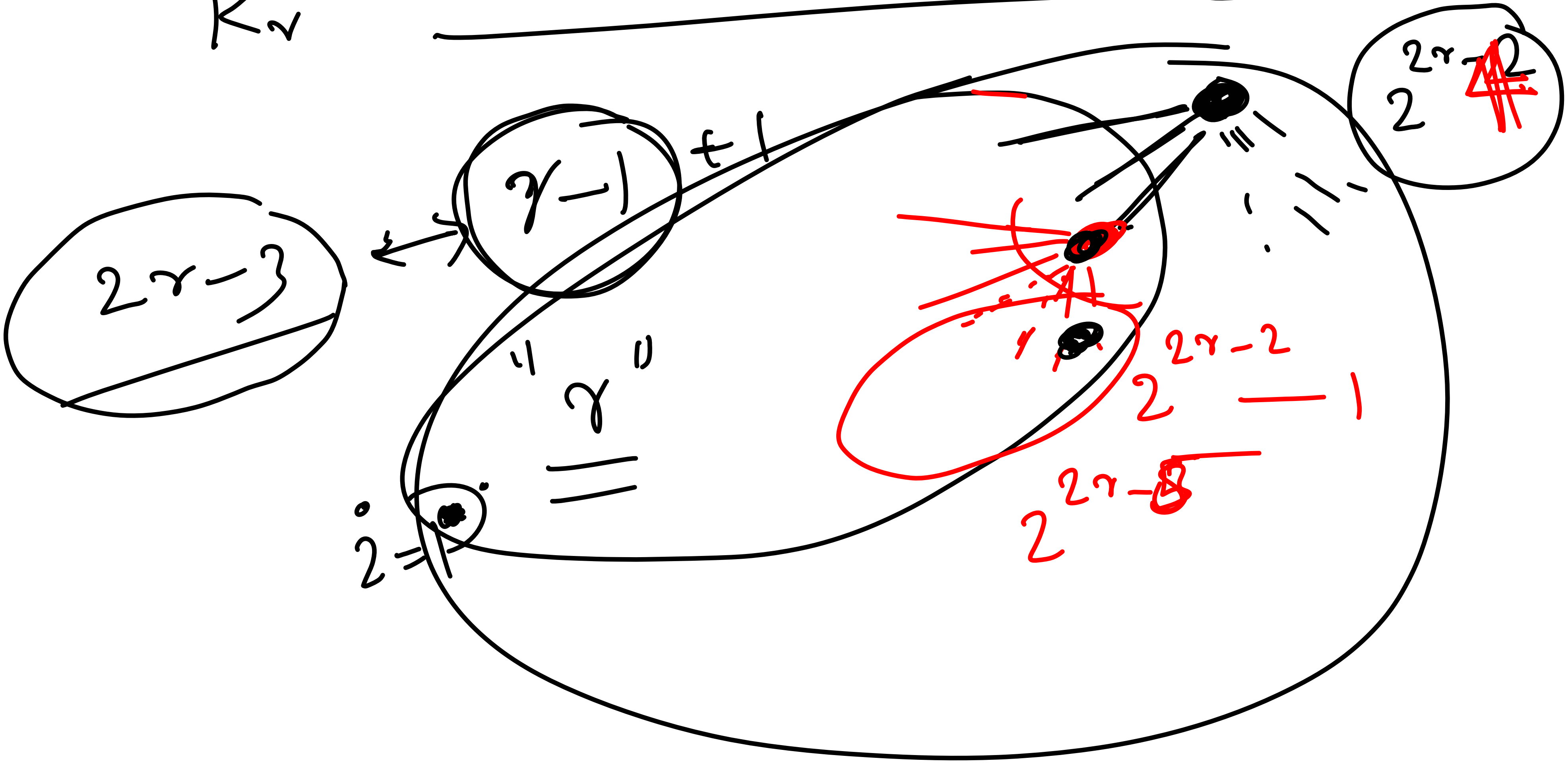


✓

$\boxed{R(\gamma) \quad ?}$

$K_{r-1} + 1 \qquad n \geq \boxed{2^{2r-3}} \qquad \underbrace{2^{2r-3} - 1}$

K_r



$$2^{\frac{r}{2}} \leq R(r) \leq 2^{2r-3}$$