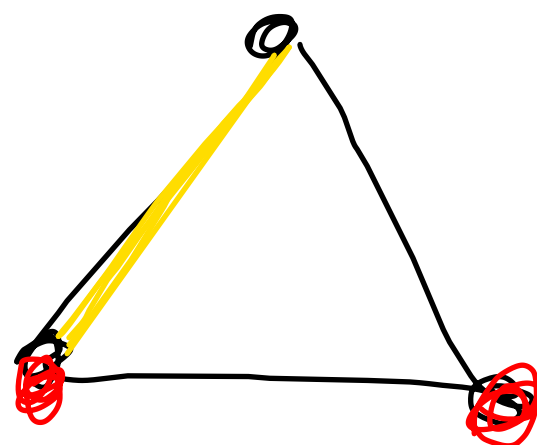
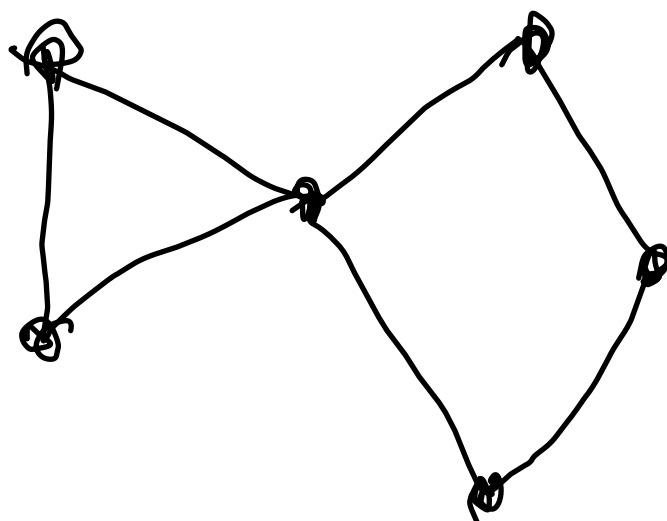
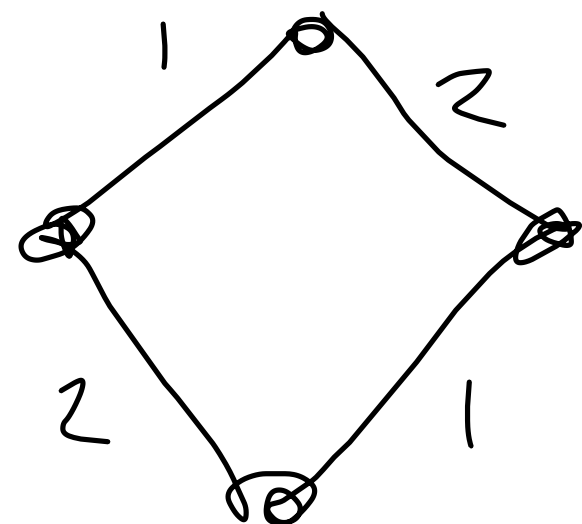
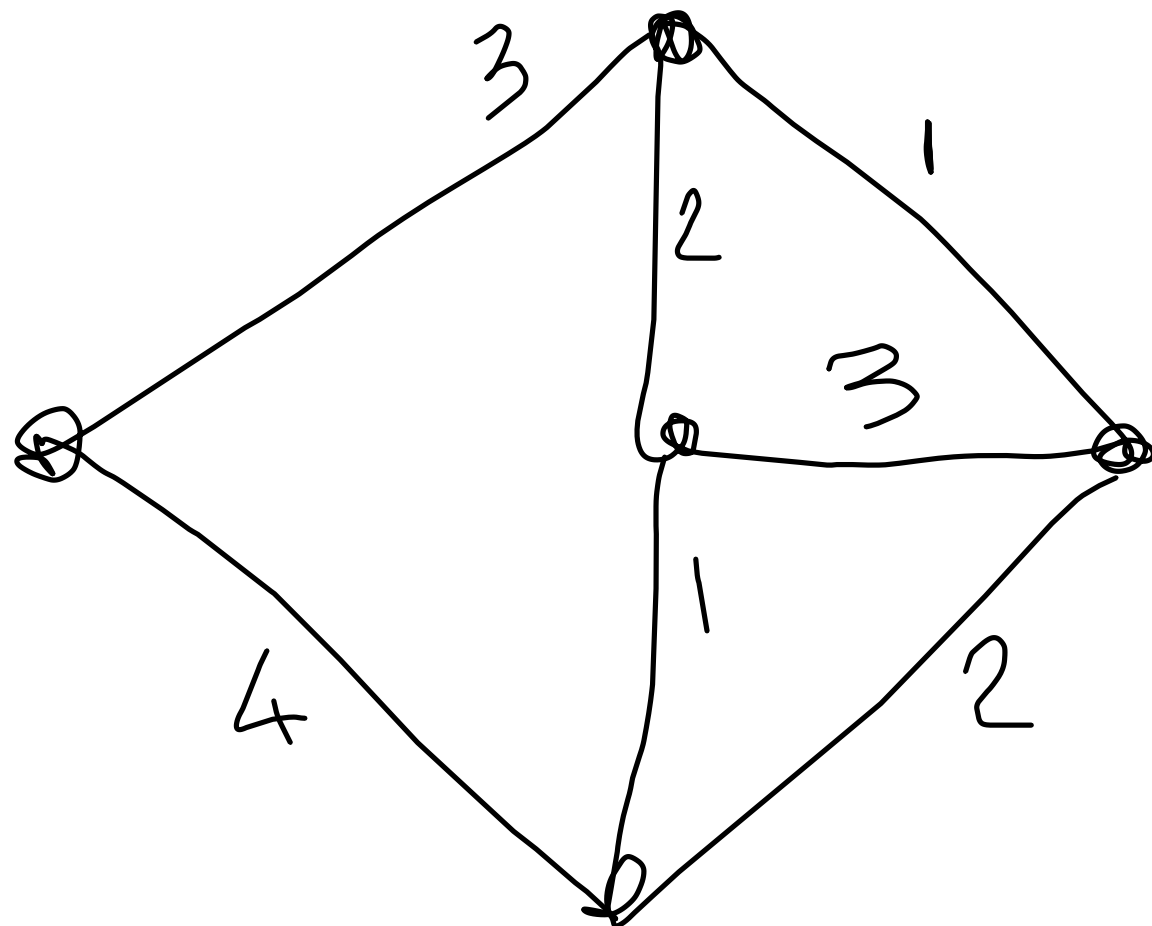
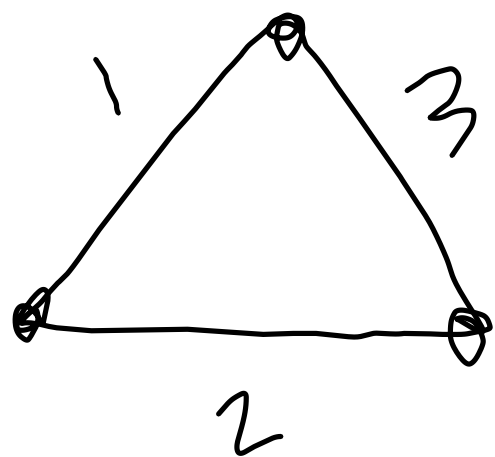




Clique Ramsey Indep. set complementary $\alpha + \beta = \nu$ Covering

~~bip. $\frac{\max}{\min} = \frac{\max}{\min}$
 ind. set $\frac{\max}{\min} = \frac{\max}{\min}$
 $|M| \leq |K|$
 bip. $\frac{\max}{\min} = \frac{\max}{\min}$~~

Matching Edge covering
 $\alpha' + \beta' = \nu$



S maximum indep. set of G
 $|S| = \alpha(G)$

K minimum covering of G
 $|K| = \beta(G)$

$$\begin{aligned} v &\geq \alpha(G) + \beta(G) \\ v &\leq \alpha(G) + \beta(G) \\ &\Downarrow \\ v &= \alpha(G) + \beta(G) \end{aligned}$$

$V-S$ is a covering (possibly not minimum)

$$|V-S| = v - \alpha(G)$$

$V-K$ is an independent set (possibly not maximum)

$$|V-K| = v - \beta(G)$$

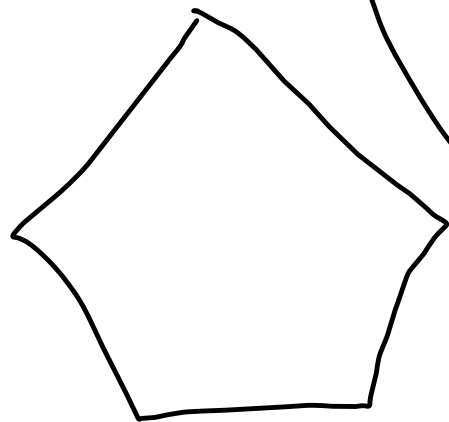
$$\begin{aligned} v - \alpha(G) &\geq \beta(G) \\ v - \beta(G) &\leq \alpha(G) \end{aligned}$$

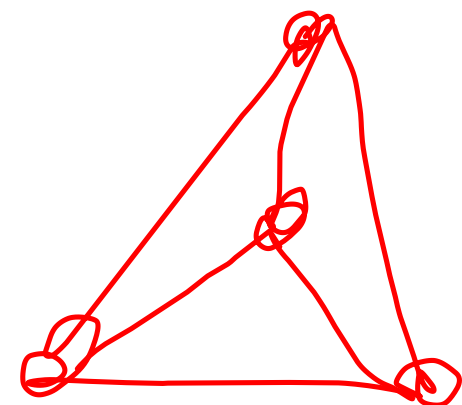
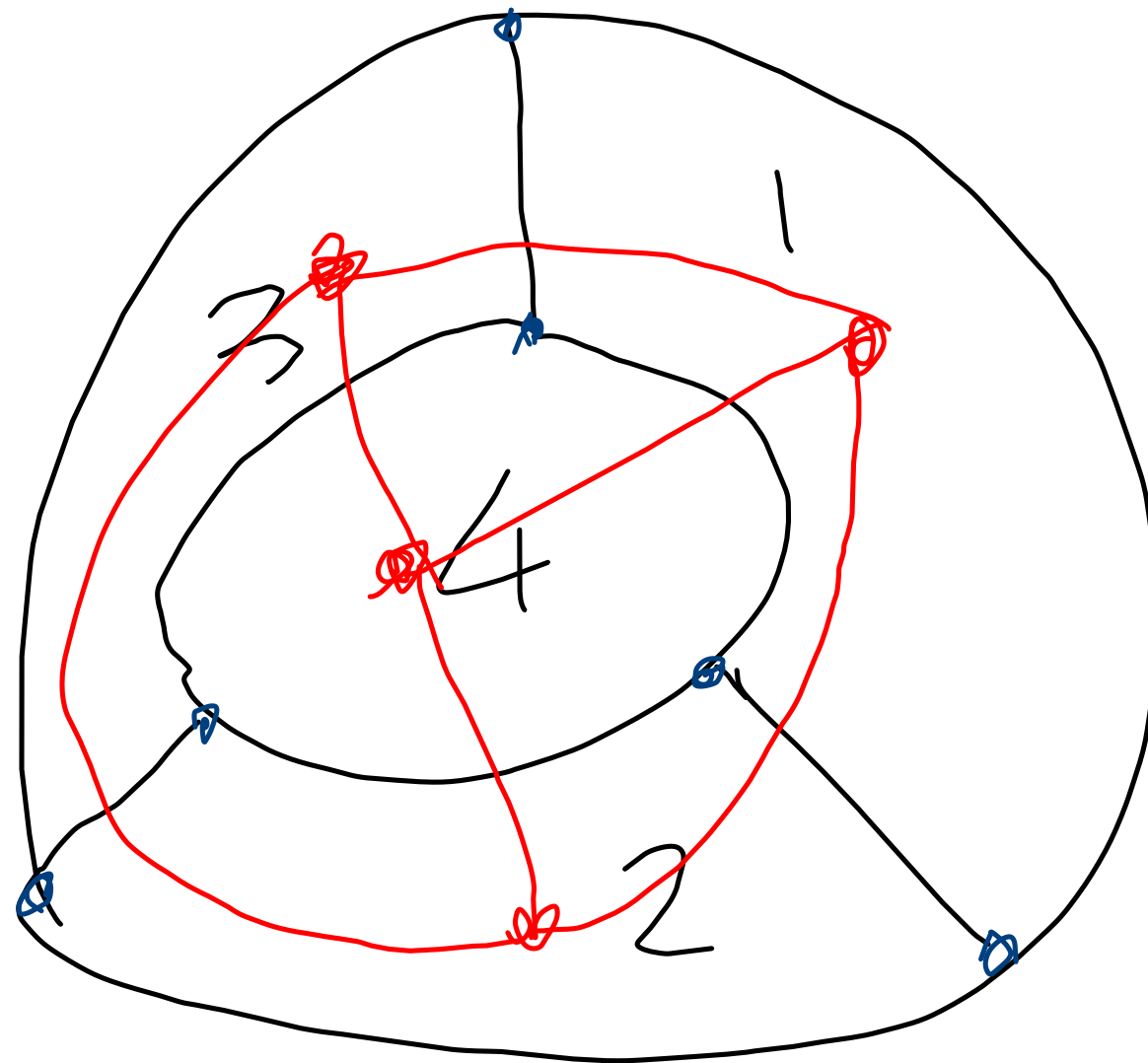
$$r(3,3) \leq r(3, \underbrace{2}_{=3}) + r(\underbrace{2}_{=3}, 3)$$

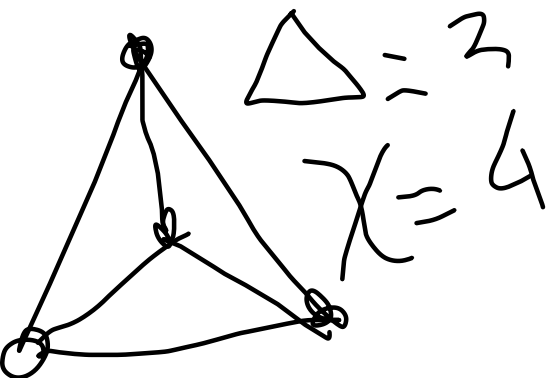
$$r(3,3) \leq 6$$

$$r(3,3) \geq 6$$

$$\Rightarrow r(3,3) = 6$$







$\Delta = 9$
 $\chi = 2$

