Theorem 5.13

If G is a graph of order n and size $m \geq n-1$, then

$$\kappa(G) \leq \left\lfloor \frac{2m}{n} \right\rfloor$$

Proof:

Since the sum of the degrees of the vertices of G is $2m$, the average degree of the vertices of G is $\frac{2m}{n}$ and so $\delta(G) \leq \frac{2m}{n}$. Since $\delta(G)$ is an integer, $\delta(G) \leq \left\lfloor \frac{2m}{n} \right\rfloor$. By Theorem 5.11 $\kappa(G) \leq \left\lfloor \frac{2m}{n} \right\rfloor$