Let G be a connected graph.

If $G = \qquad\qquad\qquad = \qquad$, then $\lambda(G) =$

In all other cases:

$\lambda(G) =$ the size of a minimal edge cut

$=$ the minimum number of edges one can remove such that the resulting subgraph is disconnected.

Thm 2.4: $\lambda(G) \leq min\{\delta(v) \mid v \in V(G)\}$

Choose $w \in V(G)$ such that

$$\delta(w) \leq \delta(v) \text{ for all } v \in V(G).$$

I.e., choose $w \in V(G)$ such that

$$\delta(w) = min\{\delta(v) \mid v \in V(G)\}$$

Case 1:

Case 2: Let $E^* = \{e \mid e \text{ is incident to } w\}$

$$= \{< w, v > \ \mid \ < w, v > \ \in \ E(G)\}$$

$$= \{< w, v > \ \mid v \ \in \ N(w)\}$$

$=$ the set of all edges having w as one of its vertices.

Note $|E^*| = \delta(w)$.

Note $(\{w\}, \emptyset)$ is a component of $G - E^*$.

Thus $G - E^*$ is disconnected since

$G = (V, E)$ is *k-edge-connected* if removing any set of $k - 1$ edges in G does not disconnect it and $|V| \geq 2$.

k edge connected implies $k - 1$ edge connected if $k > 1$

connected = 1-edge connected

$\lambda(G) =$ edge connectivity of G

$= max\{k \mid G\ k\text{-edge-connected }\}$