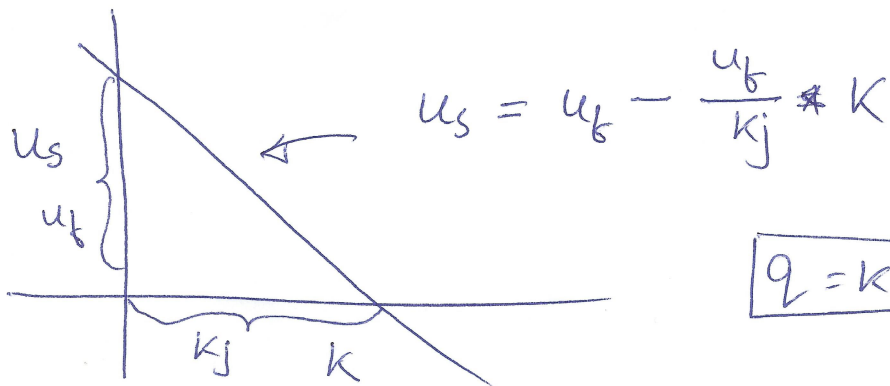


$$Q = u_f k - \frac{u_f}{k_j} k^2$$



$$Q = u_f k - \frac{u_f}{k_j} k^2$$

$$\frac{dQ}{dk} = u_f - \frac{u_f}{k_j} 2k = 0$$

$\Rightarrow k = k_j/2$

$$u_s = u_f - \frac{u_f}{k_j} \frac{Q}{u_s}$$

$$\Rightarrow u_s^2 = u_f u_s - Q u_f$$

$$\Rightarrow Q u_f = u_f u_s - u_s^2$$

$$\Rightarrow Q = u_s - \frac{u_s^2}{u_f}$$

$$\therefore \frac{dQ}{du_s} = 1 - \frac{2u_s}{u_f} = 0$$

$\Rightarrow u_s = u_f/2$