

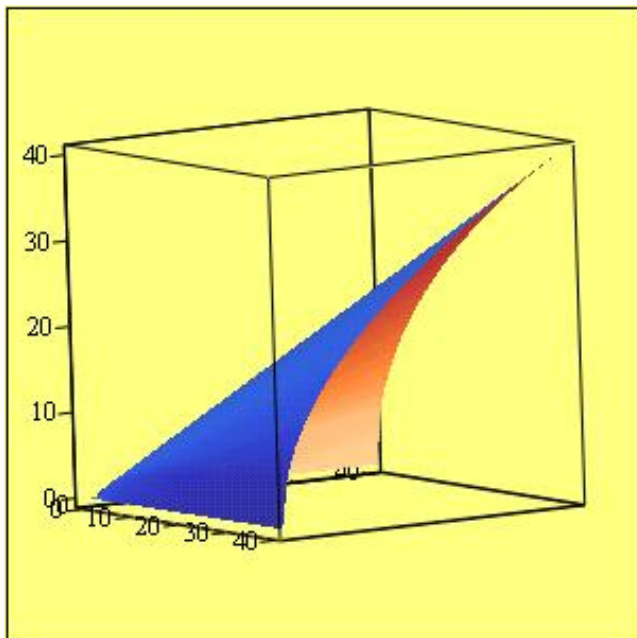
3D Graphs of Production and Utility Functions by Using Mathcad

$L := 1..40$ (Type L : 1 ; 40)

$K := 1..40$

A Cobb-Douglas production function with constant returns to scale

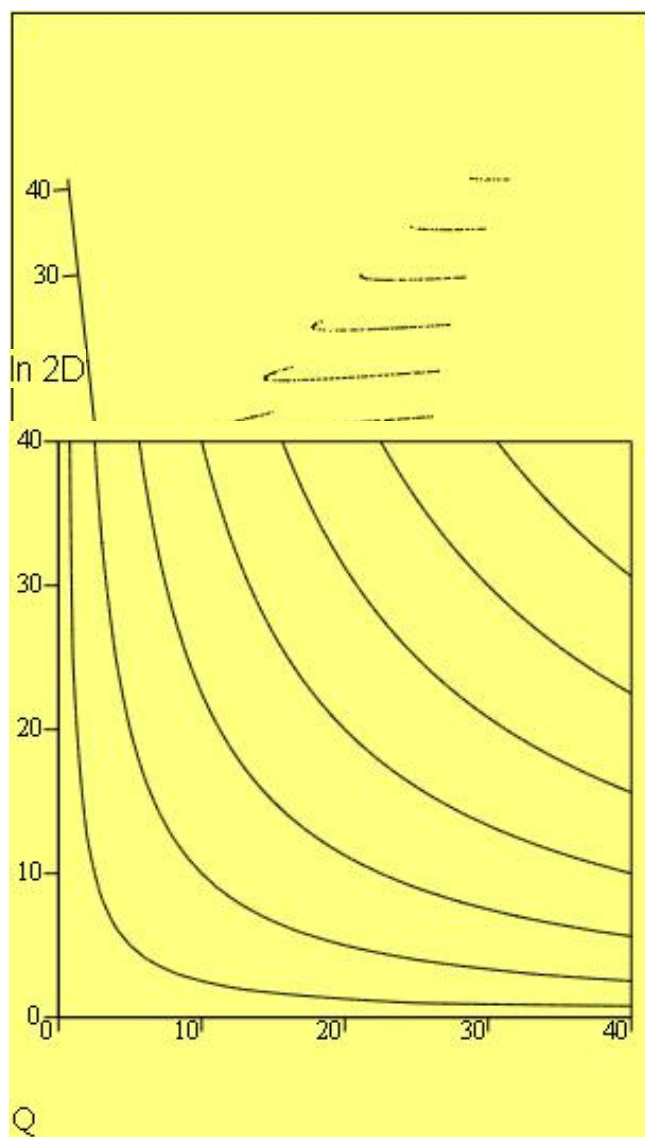
$Q_{L,K} := L^{.5} \cdot K^{.5}$ (Type Q [L , K : L ^ . 5 * K ^ . 5)



Q

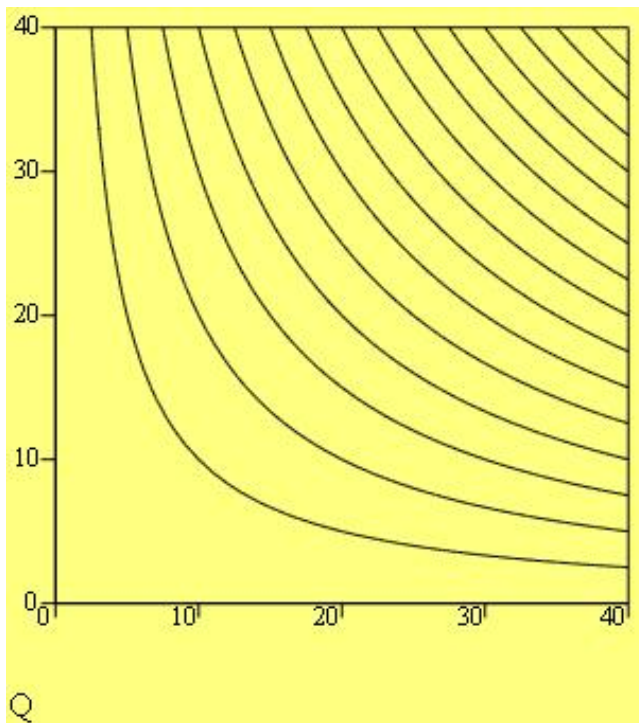
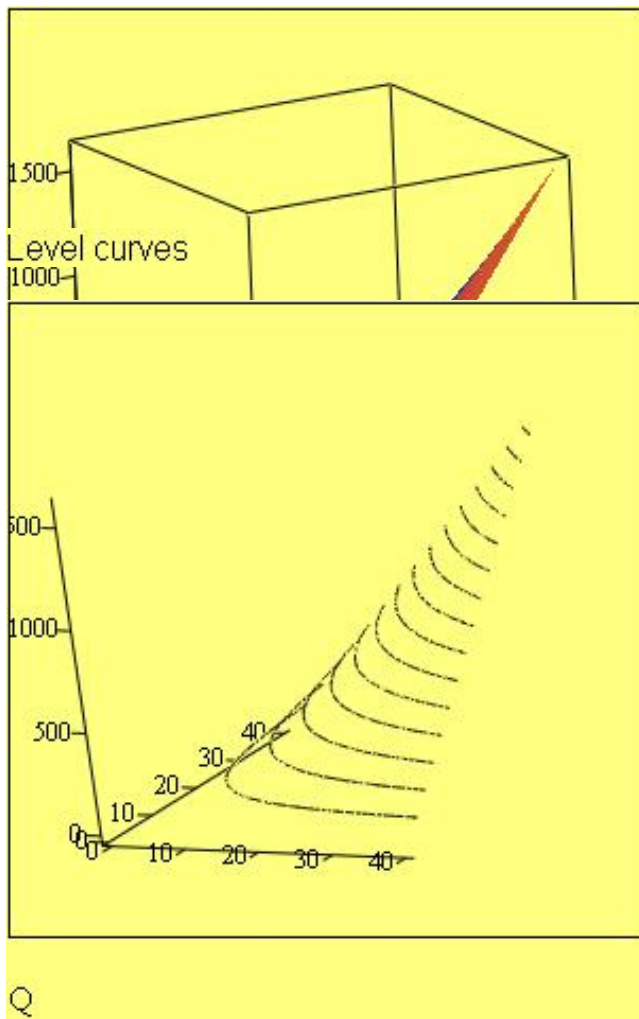
Level curves

In 3D



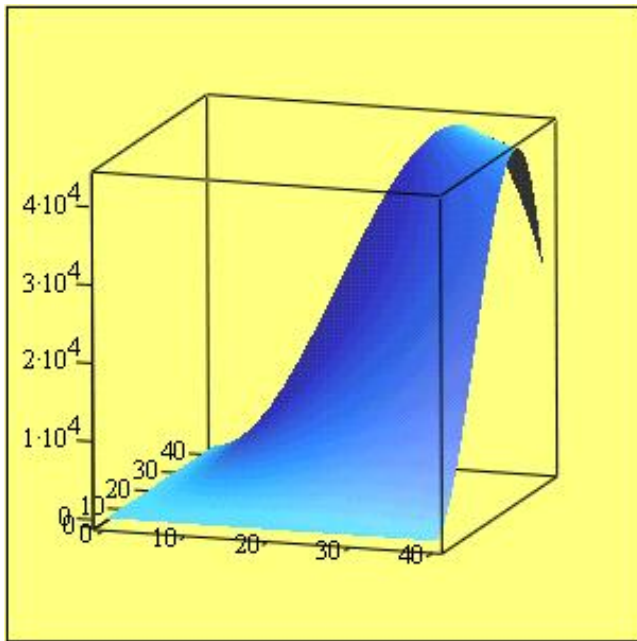
A Cobb-Douglas production function with increasing returns to scale

$$Q_{L,K} := L \cdot K$$



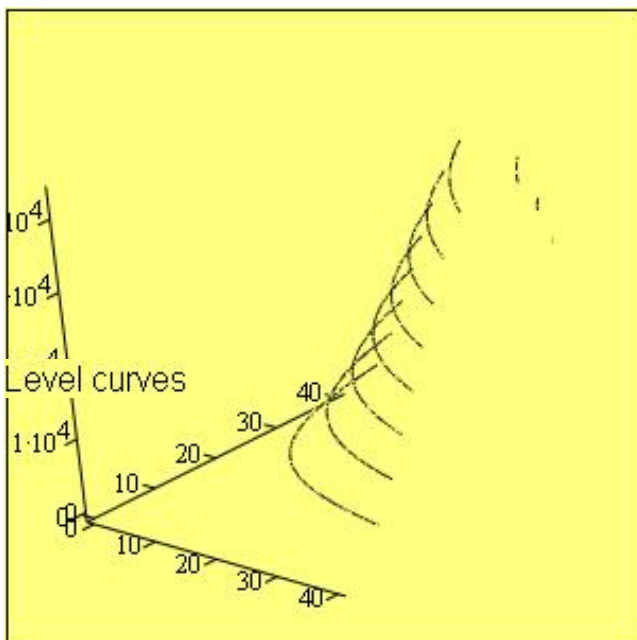
A production function with increasing and decreasing returns to scale

$$Q_{L,K} := (0.09 \cdot L^2 \cdot K^2) - (0.000005 \cdot L^3 \cdot K^3)$$

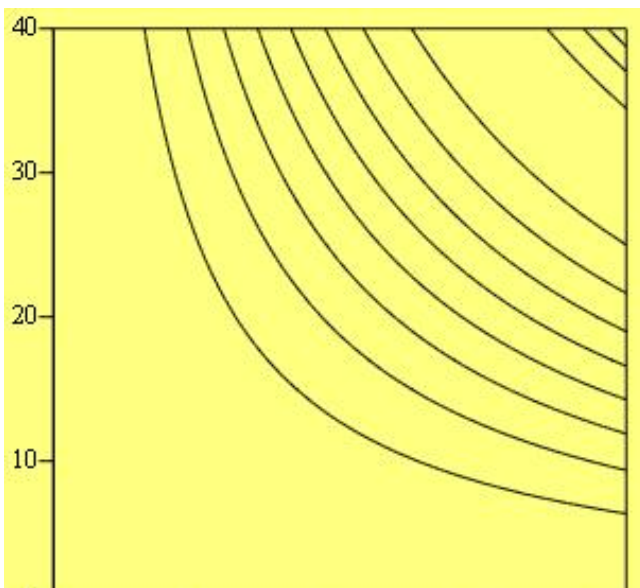


Q

Level curves

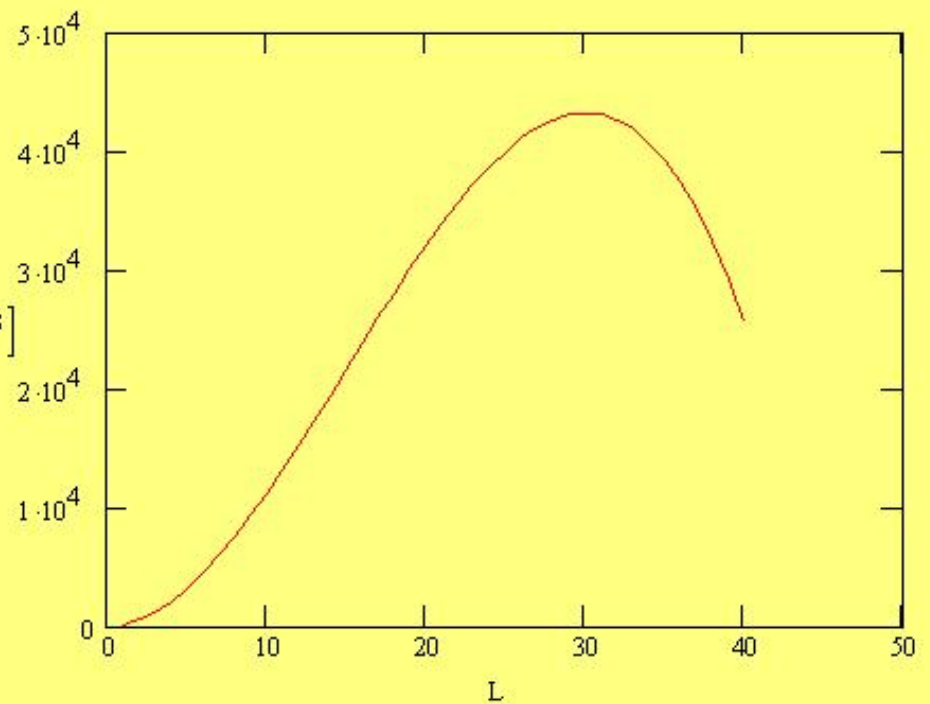


Q



The "short-run" production function obtained with $K=40$

$$\left[0.09 \cdot (L)^2 \cdot (40)^2 \right] - \left[0.00005 \cdot (L^3) \cdot (40)^3 \right]$$

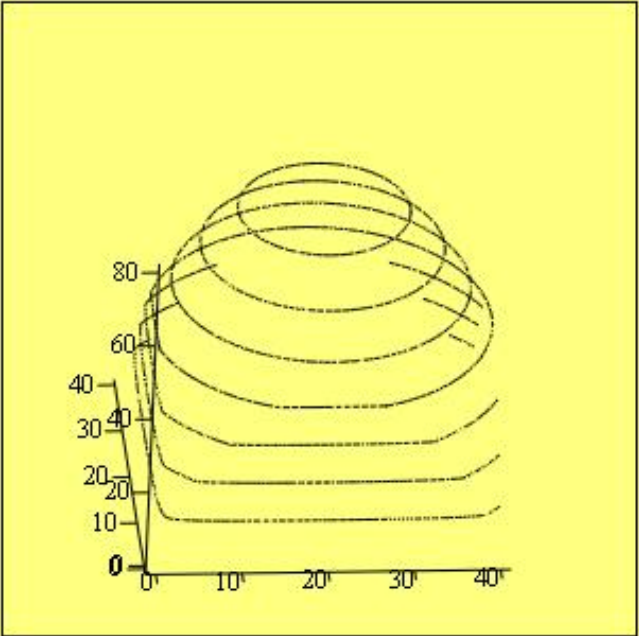
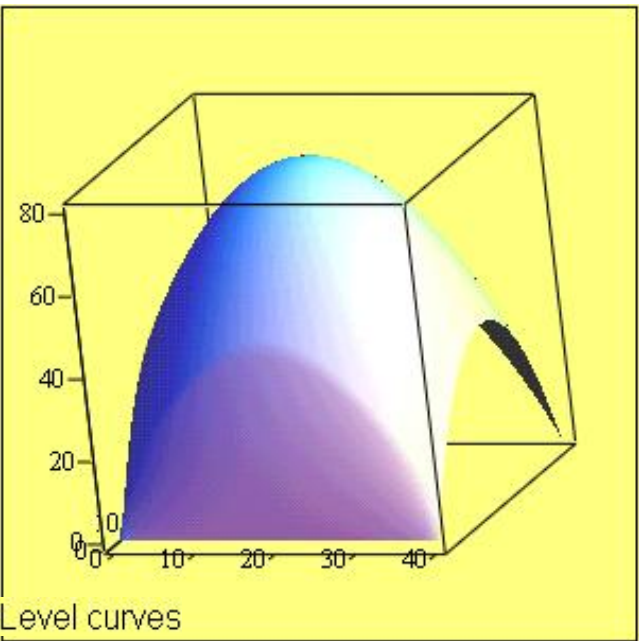


A utility function with satiation

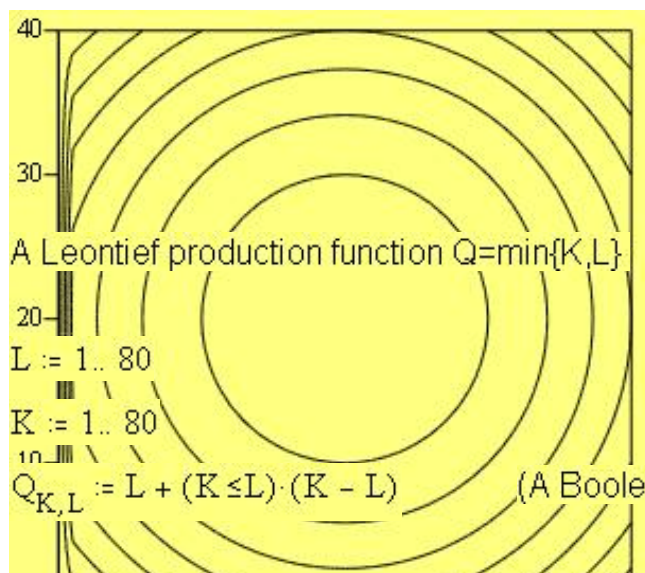
$$L := 1..40$$

$$K := 1..40$$

$$Q_{L,K} := (4 \cdot L + 4 \cdot K) - 0.1 \cdot K^2 - 0.1 \cdot L^2$$



Q



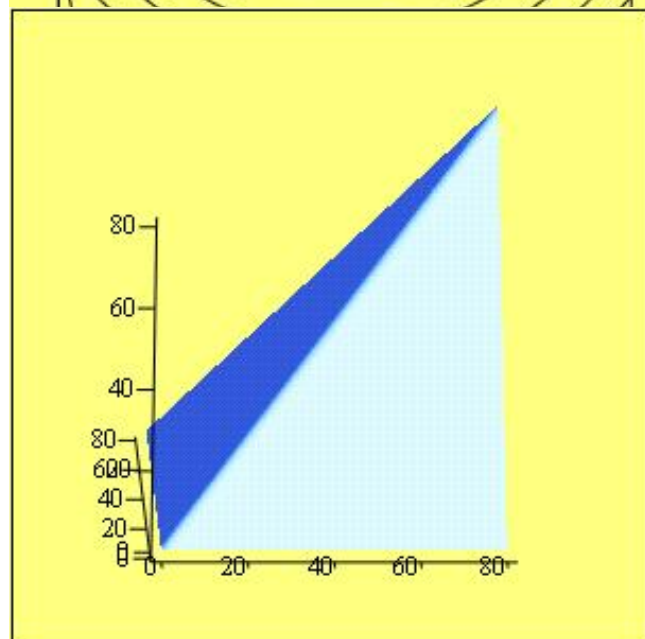
A Leontief production function $Q = \min\{K, L\}$

$L := 1..80$

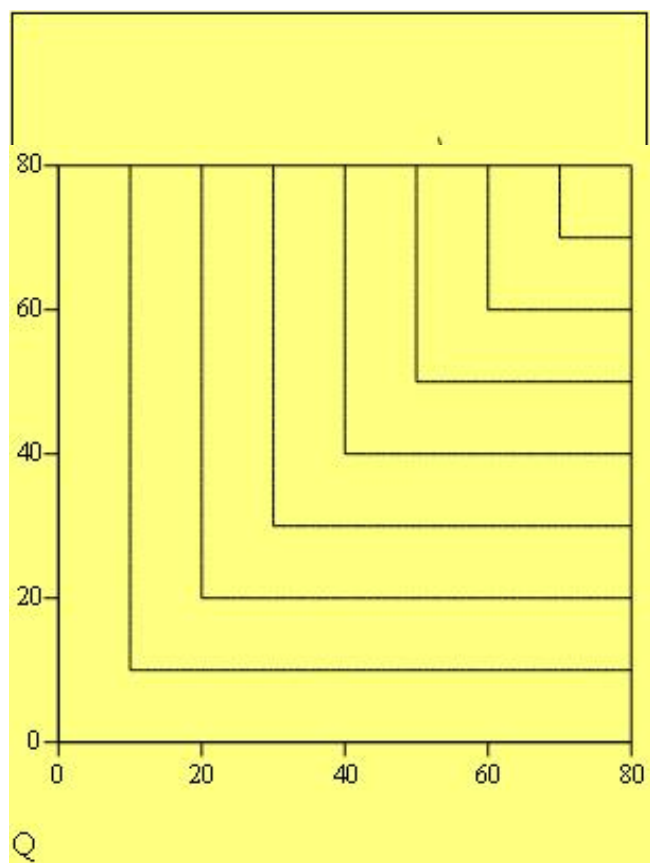
$K := 1..80$

$Q_{K,L} := L + (K \leq L) \cdot (K - L)$

(A Boolean operator returns 1 if $K \leq L$ and 0 otherwise)



Q



Copyright Theofanis Tsoulouhas, 1999