

# Problem Set

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## Cobb–Douglas production function

Let  $0 < \alpha < 1$ . Consider the following production function,

$$F(K, AL) = K^\alpha (AL)^{1-\alpha}.$$

- (1) Show that  $F$  has constant returns to scale.
- (2) Compute the capital share and labor share.
- (3) Define  $k = K/AL$  and  $f(k) = F(k, 1)$ . Derive the explicit function form of  $f$ .
- (4) Consider the Solow model with the Cobb–Douglas production function defined above. Compute the golden-rule capital stock  $k_G^*$ , for which  $f'(k_G^*) = \delta + g + n$  is met, and the corresponding golden-rule saving rate  $s_G$ , for which  $k_G^*$  is the steady state of the economy.

Answer sheet. Please write your name and id number.