

系所別: 產業經濟研究所 甲組 科目: 微積分

可選擇以英文或中文作答。

1. (20%) What is implicit function theorem. Provide an example for the application of implicit function theorem.
2. (20%) Find the extreme value(s) of $z = x + 2ey - e^x - e^{2y}$.
3. (20%) Derive the general solution for the general first-order linear differential equation $\frac{dy}{dt} + uy = w$, where u and w are functions of t .
4. (40%) Consider the CES production function, $Q = A[\delta K^{-\rho} + (1-\delta)L^{-\rho}]^{-1/\rho}$, where $A > 0$, $0 < \delta < 1$, $-1 < \rho \neq 0$.
 - (a) Show that the function satisfies Euler's theorem (i.e., $\frac{\partial Q}{\partial K} + L \frac{\partial Q}{\partial L} = Q$).
 - (b) Show that Cobb-Douglas production function (i.e., $Q = AK^\delta L^{1-\delta}$) is a special case of the CES production function.

參考用