

高微第八週作業

Rudin : p.239 # 1, 2, 3, 4, 5 .

Extra problems :

1. Analyze the following limits :

(a) $\lim_{(x,y) \rightarrow (0,0)} \frac{x+y}{x^2+y^2}$

(b) $\lim_{(x,y) \rightarrow (0,0)} \frac{e^{x^2+y^2} - 1}{x^2+y^2}$

(c) $\lim_{(x,y) \rightarrow (0,0)} \frac{xy^2}{x^2+y^4}$

(d) $\lim_{(x,y) \rightarrow (0,0)} \frac{x^3y}{x^2+y^4}$

2. Let m and n be nonnegative integers . Show that $\lim_{(x,y) \rightarrow (0,0)} \frac{x^m y^n}{x^2+y^2}$ exists if and only if $m+n > 2$