exercise 1:

(i). Let $f : \mathbb{R}^2 \to \mathbb{R}$ be defined by $f(x,y) = \dfrac{x+y}{\sqrt{x^2+y^2}}$, if $(x,y) \neq 0$ and $f(0,0) = C$, where C is a constant. Is there a constant C such that f is continuous at $(0,0)$?

(ii). Same question for $g : \mathbb{R}^2 \to \mathbb{R}$ be defined by $g(x,y) = \dfrac{x^2+2y^2}{\sqrt{x^2+y^2}}$, if $(x,y) \neq 0$ and $g(0,0) = C$.

exercise 2:

Exercise 3.7.

exercise 3:

Exercise 3.17. Hint: use power series.

exercise 4:

Find the minimum and the maximum values of the function $g(x,y) = e^{-x^2-2y^2}$ in the closed disk D with radius 1 and centered at the origin.

exercise 5:

Exercise 4.4: a and b.