exercise 1:
Set $f(x,y) = (x^2 + y^2)e^{x^2-y^2}$ for (x,y) in $\mathbb{R}^2$. Apply the second derivative test to find the local minima and maxixma of f.

exercise 2:
Optimize $f(x,y) = 4xy$ subject to the constraint $\dfrac{x^2}{9} + \dfrac{y^2}{16} = 1$.

exercise 3:
Use Lagrange multipliers to find the distance from the point $(0,1)$ to the parabola with equation $x^2 = 4y$.

exercise 4:
Exercise 4.8.

exercise 5:
Exercise 5.2: a, b.

exercise 6:
Exercise 5.3.