1. Exercises

(1) Section 14.1: 1, 11, 25, 29, 37, 43.
(2) Section 14.2: 7, 15, 23, 27.

2. Problems

(1) Consider the function \( f(x, y) = x^2 - y^2 \).
   (a) Draw a contour map of \( f \).
   (b) If \( f \) represents the elevation as a function of position, describe the corresponding terrain.
   (c) Find a point with similar behaviour on the topographic map below.

(2) Find and sketch the domains of the following functions of \( x \) and \( y \).
   (a) \( \sqrt{9 - 9x^2 - y^2} \)
   (b) \( \frac{x^2 - y^2}{x^2 + y^2} \)
   (c) \( \frac{x^2 + y^2}{x^2 - y^2} \)

(3) Show that the function \( f(x) = |x| \) is continuous as a function on \( \mathbb{R}^3 \).

(4) Match the following functions of two variables against their graphs in 3 dimensions and their contour graphs. Explain why your answer is correct.
   (The graphs and contours are on the next two pages.)
   (a) \(-x + \sin(y)\)
   (b) \(\sin(x)/(1 + y^2)\)
   (c) \(\max(|x|, |y|)\)
   (d) \(|x + y|\)
   (e) \(\sqrt{x^2 + y^2}\)
   (f) \(-x^2 - y^2\)