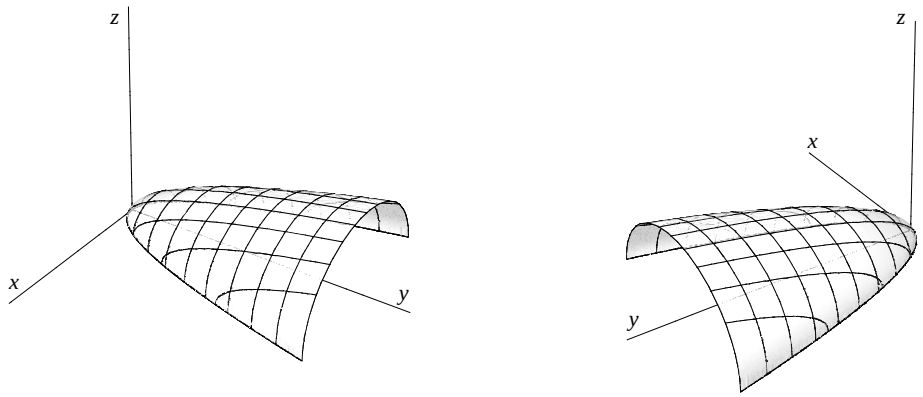
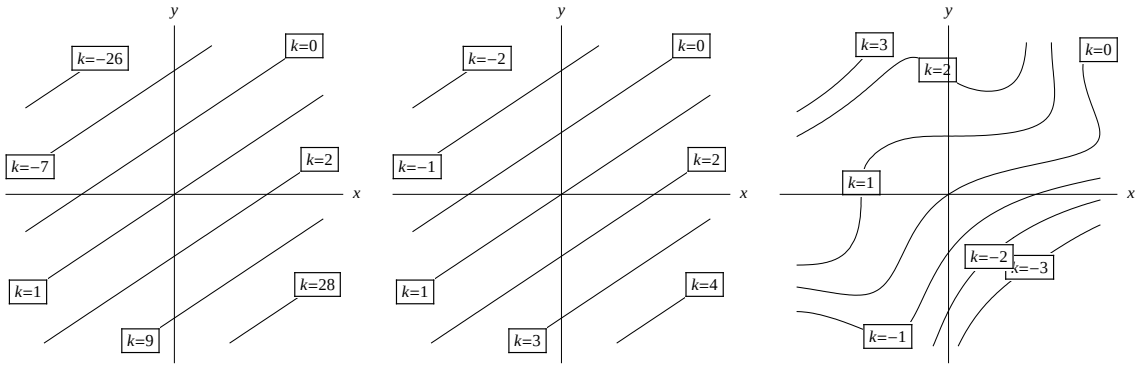
Functions and Graphs

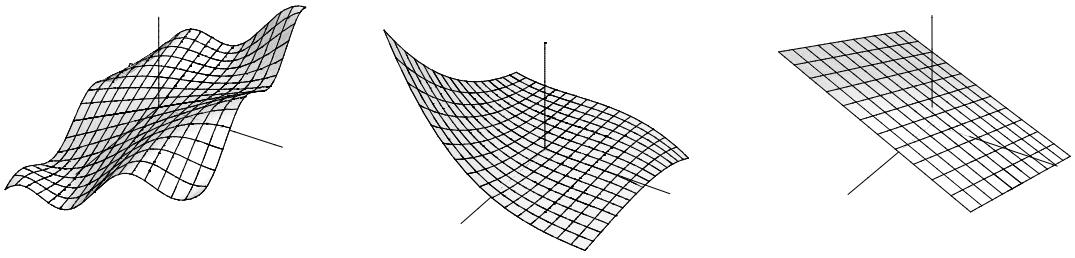
Here is the graph $z = \sqrt{y - x^2}$ of the function $f(x, y) = \sqrt{y - x^2}$, shown from two different angles.



1. The first row shows traces of three graphs $z = f(x, y)$ in the planes $z = k$. (Traces of the graph $z = f(x, y)$ in $z = k$ are also known as level sets of $f(x, y)$.) Match each diagram with the graph of the function.

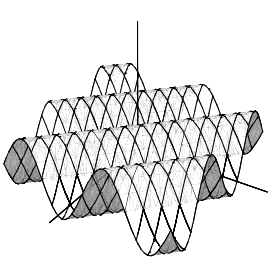


(I) (II) (III)

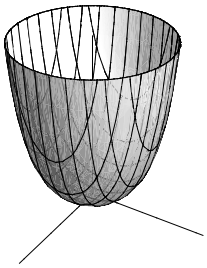


(a) (b) (c)

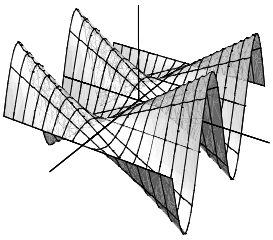
2. Here are several surfaces.



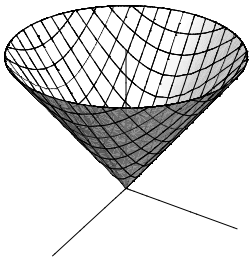
(I)



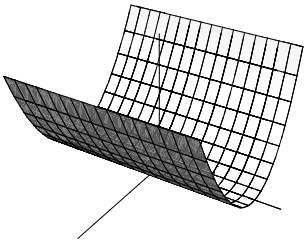
(II)



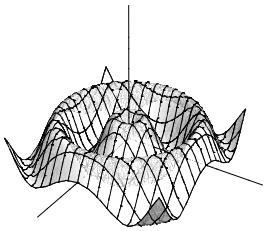
(III)



(IV)



(V)



(VI)

Match each function with its graph.

(a) $f(x, y) = x^2$.

(b) $f(x, y) = \sqrt{x^2 + y^2}$.

(c) $f(x, y) = e^{x^2+y^2} - 1$.

(d) $f(x, y) = y \sin x$.

(e) $f(x, y) = \sin(x + y)$.

(f) $f(x, y) = \sin\left(\sqrt{x^2 + y^2}\right)$.