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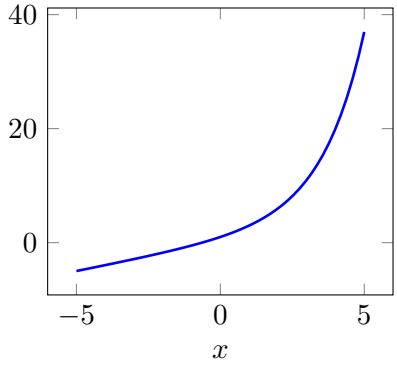
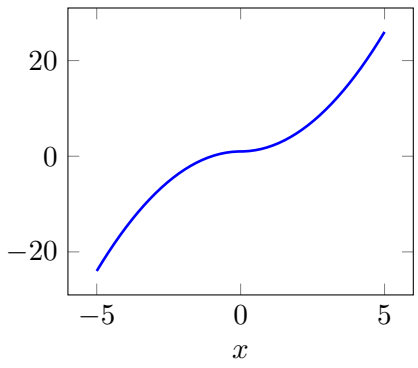
# CK0030: Homework 01

**Exercise 1.** Consider the functions $f(x)$, $g(x)$ and $h(x)$ below,

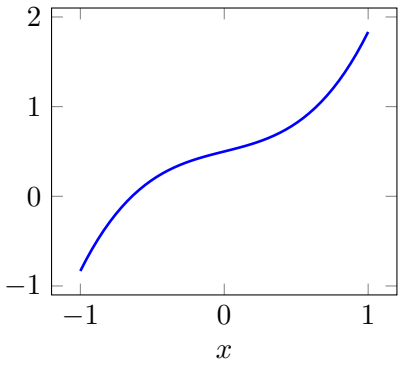
$f(x) = 2^x + x$




$g(x) = x|x| + 1$



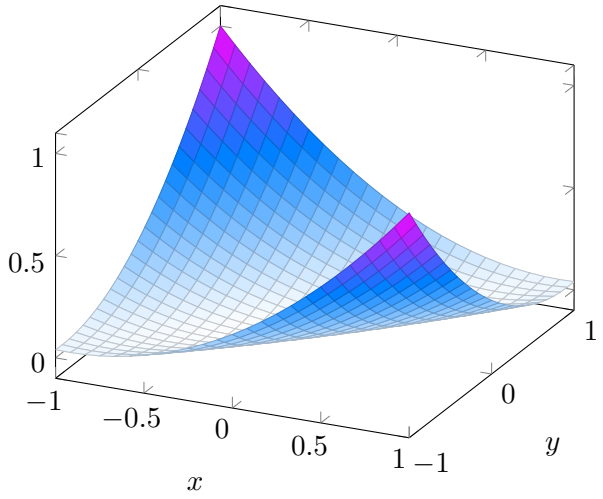

$h(x) = 5^x/(1 + 5^x) + x^3$



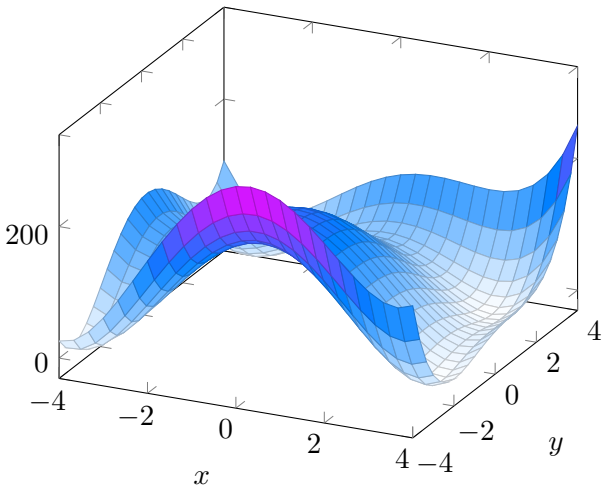

Write Python code to evaluate them at points $x \in \{-4/5, 0, +4/5\}$.

**Exercise 2.** Consider the functions $f(x, y)$ and $g(x, y)$ below,

$f(x, y) = 0.26(x^2 + y^2) - 0.48xy$




$g(x, y) = (x^2 + y - 11)^2 + (x + y^2 - 7)^2$




Write Python code to evaluate them at point $(x, y) \in \{(0, 0), (1, 0), (0, 1), (1, 1), (-1, 0), (0, -1), (-1, -1)\}$.

**Exercise 3.** Consider the following functions:

$$\rightsquigarrow\ f(x, y) = \sin(y)e^{\left\{\left[1-\cos(x)\right]^2\right\}} + \cos(x)e^{\left\{\left[1-\sin(y)\right]^2\right\}} + (x - y)^2;$$

$$\rightsquigarrow\ g(x, y) = -(y + 47)\sin\left[\sqrt{\left|x/2 + (y + 47)\right|}\right] - x\sin\left[\sqrt{\left|x - (y + 47)\right|}\right].$$

Write Python code to evaluate them at any point $(x, y)$ of your choice.