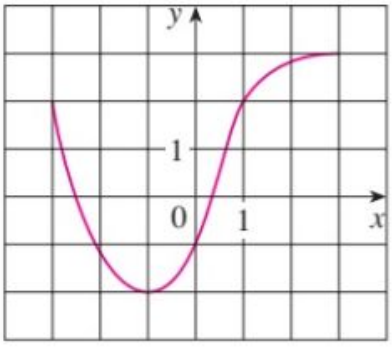
Practice 1 (Functions)

Exercise 1. The graph of a function is given following:

a) State the value of $f(-1)$ and $f(2)$

b) For what values of x is $f(x) = 2$?

c) State the domain and range of $f(x)$.



Exercise 2. Find the domain of the functions

a) $f(x) = \dfrac{2x+1}{x^2+x-2}$

b) $g(x) = \dfrac{x}{x^2+1}$

c) $h(x) = \sqrt{3-x} + \sqrt{x^2-1}$

Exercise 3. State the domain and range of each function. Without using a calculator, make a rough sketch of the graph.

a) $f(x) = 2 - x^2$

b) $g(x) = (x+1)^3$

c) $h(x) = 1 + x^{-1}$

d) $i(x) = 2\sqrt{x}$

e) $j(x) = -2^x$

Exercise 4. Let

$$f(x) = \begin{cases} 2 - x^2 & \text{if} \quad x \leqslant 0 \\ \\ 2x - 1 & \text{if} \quad 0 < x \end{cases}$$

a) Evaluate $f(-2)$, $f(0)$ and $f(2)$

b) Sketch the graph of f.

Exercise 5. If $f(x) = x^2+2x-1$ and $g(x) = 2x-3$, find each of the following functions

a) $f \circ g$

b) $g \circ f$

c) $g \circ g \circ g$

Exercise 6. Are the following functions odd or even?

a) $f(x) = x^2 - 1$

b) $g(x) = \cos(x)$

c) $h(x) = x^5 + x^4$

d) $i(x) = x - 1$