Problem sheet 3

(1) Find the domain and range of the functions $F(x) = \frac{1}{x-1}$ and $g(x) = \frac{1}{1-\sqrt{x-2}}$.

(2) Problems 7. and 8. in excercises P.4 in the Calculus book.

(3) Which symmetries do the graphs of the following functions possess? In particular, is f even or odd?

   (a) $f(x) = \frac{1}{x+4}$.

   (b) $f(x) = x^3 - 2$.

   (c) $f(x) = \sqrt{2x}$.

   (d) $f(x) = \sqrt{(x-1)^2}$.

(4) Sketch the graph of the following functions

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

   (b) $f(x) = (x-1)^2 + 1$.

   (c) $f(x) = \sqrt{x+1}$.

   (d) $f(x) = 1 + |x-2|$.

   (e) $f(x) = \frac{x}{1-x}$.

(5) For $x \in [-\pi, \pi]$, let $f(x) = \cos x$. Let $g(x) = 1 - f(1-x)$. What are the domain and range of g? Sketch the graph of g.

(6) What function $f(x)$, with domain $\mathbb{R}$, is both even and odd?