MA1E01: Tutorial week 2

REMEMBER TO HAND BEFORE THE TUTORIAL STARTS

1. Functions, domain and range of a function.
2. Operations with functions, composition of functions

Problem 1 *Compute the Domain of the following functions:*

1. $f(x) = 1/\sqrt{x - 43}$
2. $f(t) = \frac{\pi\sqrt{(t-7)^2}}{(t-2)(t-1)}$

Problem 2 *Compute the Domain of the following functions:*

1. $f(x) = \frac{e^{\pi}\log(\tan^2(3\arcsin(0.5)))}{\sqrt{3-x}}$
2. $g(h) = \frac{\pi\sqrt{h^2-2h+1}}{h-\sqrt{\pi}}$
3. *The functions:* $s(x) = f(x) + g(x)$, $m(x) = f(x) - g(x)$, $p(x) = f(x) * g(x)$, $r(x) = f(x)/g(x)$, $d(x) = g(x)/f(x)$.

Problem 3 *Given the functions*

$$\begin{aligned} f(x) &= \sqrt{x-3}\,, \\ g(x) &= x^2 + 4\,. \end{aligned}$$

Determine the function and the domain of

- $f(x) + g(x)$
- $f(x) - g(x)$
- $f(x)g(x)$
- $g(x)/f(x)$
- $(f \circ g)(x)$
- $(g \circ f)(x)$

Problem 4 *Given the functions*

$$\begin{aligned} f(x) &= \frac{2}{x-1}\,, \\ g(x) &= x^2 + 2\,. \end{aligned}$$

Determine the function and the domain of

- $f(x) + g(x)$
- $f(x) - g(x)$
- $f(x)g(x)$
- $g(x)/f(x)$
- $(f \circ g)(x)$
- $(g \circ f)(x)$

Problem 5 *Sketch and explain the main characteristics of the graph of the following functions*

- $f(x) = 6x^2 - 12x - 18$

Problem 6 *Sketch and explain the main characteristics of the graph of the following function*

- $f(x) = -x^2 + 2x - 5$