Notations used in some of the math1010 groups

- $[a,b], (a,b), (a,b], [a,b), (-\infty,b], (a,\infty), (-\infty,b), [a,\infty), (-\infty,\infty)$(also denoted by $\mathbb{R}$)
- $x \overset{f}{\mapsto} f(x)$ (we sometimes put the 'name' of the function, e.g. f over the '$\mapsto$' sign) (In our course, x is usually a real no., and also $f(x)$.)
- $D \overset{f}{\to} \mathbb{R}$, where again we put sometimes the 'name' of the function over the arrow sign. Here D denotes the domain of the function f.

Exercises

(Keywords: absolute value, function, domain)
This set of exercises aims to help you remember concepts that may be useful in the future.

1. Show the following for absolute value: Let a, b be two real nos., then
   (a) $|a \cdot b| = |a||b|$.
   (b) $|a+b| \leq |a| + |b|$. (Hint: You can show them by considering all possible cases).
2. In each of the following, find all real numbers x satisfying the respective inequality:
   (a) $\dfrac{x^2+4}{5x-2} \leq 1.$
   (b) $\left|\dfrac{x+1}{x-1}\right| \leq 1.$
3. Sketch (i.e. draw roughly) the graph of the function given by
   (a) $f : [-5,5] \to \mathbb{R}$, given by $f(x) = x^2 + 2x - 2$.
   (b) $g : [-5,5] \to \mathbb{R}$ given by $g(x) = x|x| + 2x - 2$.
4. Let's call the largest set D of real numbers x on which a function (e.g. f) is definable the maximal domain of f. Find the maximal domain of the function f given by

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