Math 180/103 Winter 2011
Due 15th Sep

Homework 1

Exercise 1. a) Explain with your own words what " $\lim_{x\to 3^-} f(x)$ " means.

b) Explain with your own words what " $\lim_{x\to 5} f(x)$ " means and what it implies about the left-hand and right-hand limits.

c) Explain what the difference between the limit " $\lim_{x\to 2} f(x)$ " and the value $f(2)$ is.

Exercise 2. Consider the function $f(x) = \begin{cases} -x^2+4 & \text{for } x \neq 2 \\ 3 & \text{for } x = 2. \end{cases}$

a) Graph the function.

b) Does $\lim_{x\to 2} f(x)$ exist? If yes, what is the value of the limit, if not explain why it does not exist.

c) What is the value of the function at $x = 2$, i.e., what is $f(2)$?

Exercise 3. Consider the function $f(x) = \begin{cases} 2x^2-1 & \text{for } x \leqslant 1 \\ 5x-2 & \text{for } x > 1. \end{cases}$

a) Graph the function.

b) Compute $\lim_{x\to 1^-} f(x)$.

c) Compute $\lim_{x\to 1^+} f(x)$.

d) Does $\lim_{x\to 1} f(x)$ exist? why?

Exercise 4. Give the equations of the lines passing through the two points :

a) $P = (1, 2)$ and $Q = (3, 7)$,

b) $P = (-1, -1)$ and $Q = (3, -4)$,

c) $P = (1, 2)$ and $Q = (1, 7)$.

In each also indicate the slope of the line.

Exercise 5. Factorise (i.e., write as product of polynomials of degree 1) the following polynomials :

a) $x^2 - 5x + 6$,

b) $x^4 - 10x^3 + 35x^2 - 50x + 24$,

c) $x^3 + 4x^2 - 31x - 70$.

Exercises from the Textbook

- §2.1 : 3, 5
- §2.2 : 7, 9, 11, 17, 21, 23, 29, 37

Due Thursday 15th September at the beginning of class :
Exercises 1, 2, 3, 4, 5; §2.2 : 12, 16, 30, 36

Directions concerning the page setup for assignments :

- On the top of the first page write clearly and in this order your
  Last Name : First Name : Student Number :
- The title ("Homework 1")
- The title of every exercise and clearly separate the exercises
- Staple the sheets together

Remember that there are marks for presentation and explanations, just a bunch of numbers or equations won't give you full mark.