TD 7 – CALCULUS

(1) Compute the MacLaurin series of the following functions:

   (a) Hyperbolic function: $\cosh(x) = \frac{e^x + e^{-x}}{2}$,

   (b) $\cos^2(x)$ (Hint: $\cos^2(x) = (1 + \cos(2x))/2$),

   (c) $\sin(x) \cdot \cos(x)$ (Hint: Try to find a formula for trigonometric functions which translates this expression into an expression with sin only).

(2) Calculate the integral

$$\int_{-1}^{3} x^3 + 1 \, dx$$

using the original definition with infinite sums. Hint: look up on Wikipedia formulas for the sum of the first n cubes. Note that the formulas will get pretty "nasty".