CS112 - Homework Set 1

Due date Friday, January 18th

The homework must be submitted online in electronic form using the PDF format. Verify that the file is readable before submitting, broken files and late submissions will not be graded. Please indicate your complete name in the headings.

A.

Find the Laplace Transform of:
$f(x) = e^{ax}$
$f(x) = x^2$
$f(x) = 4x^2 - 3x + 7$
$f(x) = (x-1)^2$

B.

Sum the series: $\sum_{i=1}^{n} n^3$

C.

Using partial fractions decompose:
$F^*(s) = \frac{s+3}{(s-2)(s+1)}$
$F^*(s) = \frac{1}{(s^2+1)(s^2+2s+1)}$

D.

Consider the previous results as the Laplace transform $\mathcal{L}(f(x))$ of some f(x), find f(x) using the tables

E.

Solve the following differential equation:
$x(t) = \frac{dx(t)}{dt} + 2\frac{d^2x(t)}{dt^2}$

$x(0) = 1\ x'(0) = \frac{1}{2}$