ASSIGNMENT 6

Due on: November 13 at 8:00 in the morning (submit before class begins).

Be sure to write your name and student ID on your assignment.

Questions:

- (1) Find the *absolute* minimum and maximum of the function $f(x) = x^3 e^x$ on the interval [-10, 1].
- (2) Compute the following limits:
 - (a) $\lim_{x \to \infty} \frac{4+2x^2}{1-6x-x^2}$ (b) $\lim_{x \to 2^-} \frac{x^2+2}{x^2-4}$ (c) $\lim_{x \to 2^-} \frac{100}{x^2-x^2} = -\frac{1}{2}$

(c)
$$\lim_{x \to 0^+} \frac{100}{x} - \frac{1}{x^2}$$

(d)
$$\lim_{x \to 1} \frac{2^x - 2}{\ln x}$$

(e)
$$\lim_{x \to -\infty} x^3 \cdot 3^x$$

- (3) Do the following for each of the functions below:
 - Find increasing and decreasing intervals.
 - Find local extremities.
 - Final concaving up and concaving down intervals.
 - Find inflection points.
 - Find all asymptotes (horizontal and vertical).
 - Draw a graph of the function, indicating all previous information. The functions:
 - (a) $f(x) = \frac{2x}{x^2+1}$

(b)
$$f(x) = \frac{1}{x^3 - 3x}$$

$$\begin{pmatrix} a \\ c \end{pmatrix} f(a) \\ e^x \\$$

(c) $f(x) = \frac{e^x}{x^2}$