Complete study of the function f(x) defined by f(x)=exp(1/x)

Study of the function f:

1. Domain of function:

for all real x , x E (-∞ ,0)U(0,+ ∞); in x =0 is break point

2. Function f(x) is not symmetrical, and there is no asymmetric

3. Function is aperiodic.

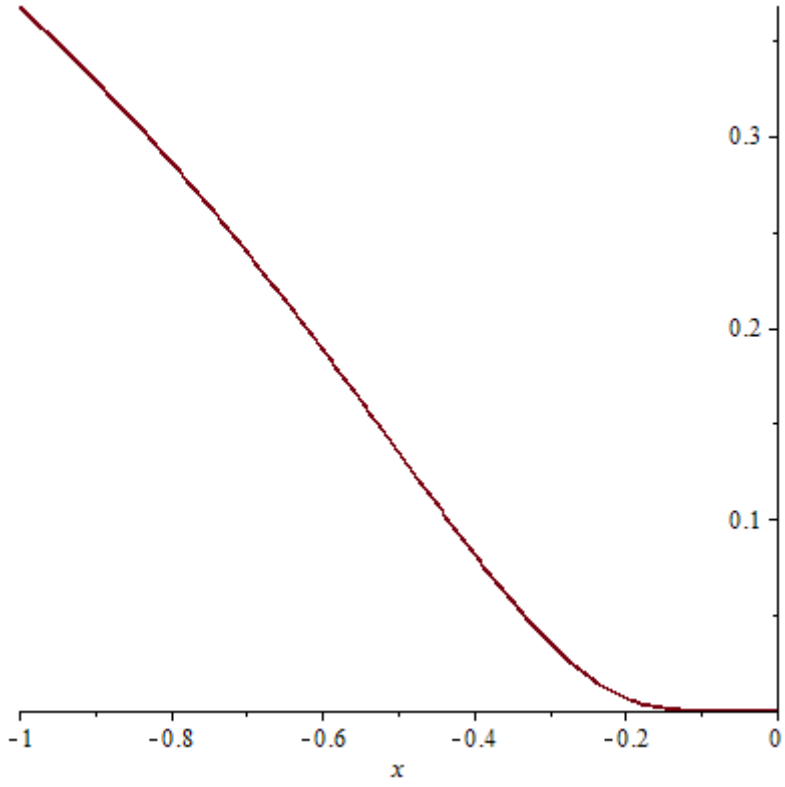
4. The points of intersection with the coordinate axes

$$\lim_{x\to+\infty} e^{\frac{1}{x}} = 1$$

$$\lim_{x\to-\infty} e^{\frac{1}{x}} = 1$$

So, for the function have horizontal asymptotic f(x)=1

$$\lim_{x\to-0} e^{\frac{1}{x}} = 0$$



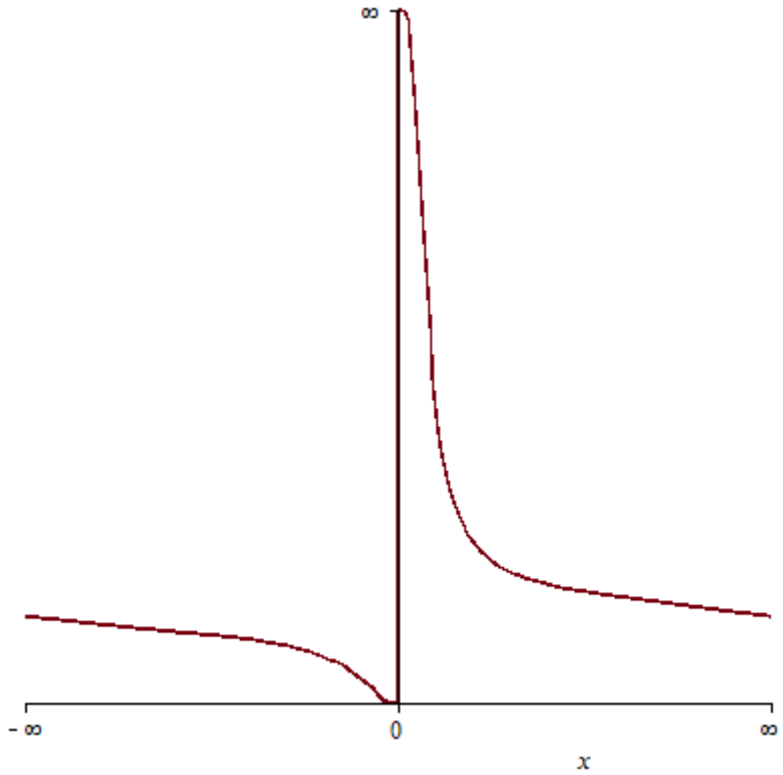
$\lim_{x\to+0} e^{\frac{1}{x}} = +\infty$ so y-axes is a vertical asymptotic for x>0

The first derivative of the function is f'(x) = - ((exp(1/x))/x^2)

and we have, for all real x: f'(x)=-((exp(1/x))/x^2) < 0 always negative and function decreases for x E (-∞ ,0)U(0,+ ∞);

5.

Let’s make graphical representation of this function on the same graph:



And with horizontal asymptotic y=1