I –Functions with Exponential and Absolute value. Sketch the graph of each of the following functions : f_1 to f_6 *[Show f_0 with f_1 and f_2 only]*

$$f_0(x) = e^x \quad ; \quad f_1(x) = e^{-x} \quad ; \quad f_2(x) = -e^{-x} \quad ; \quad f_3(x) = e^{|x|}$$

$$f_4(x) = e^{x-1} - 2 \quad ; \quad f_5(x) = e^{|x-1|} - 2 \quad ; \quad f_6(x) = e^{|x|-1} - 2$$
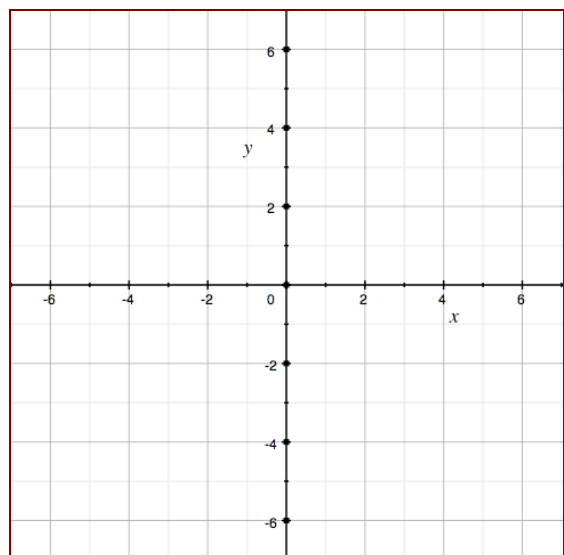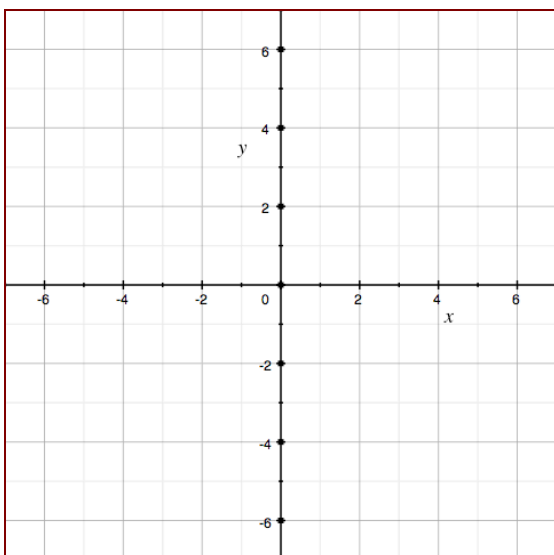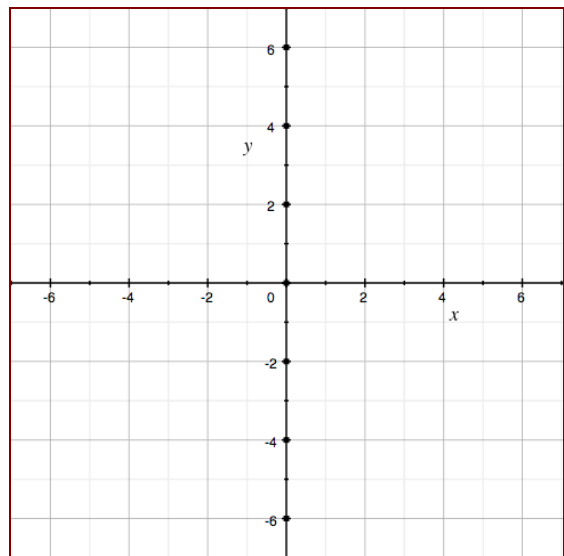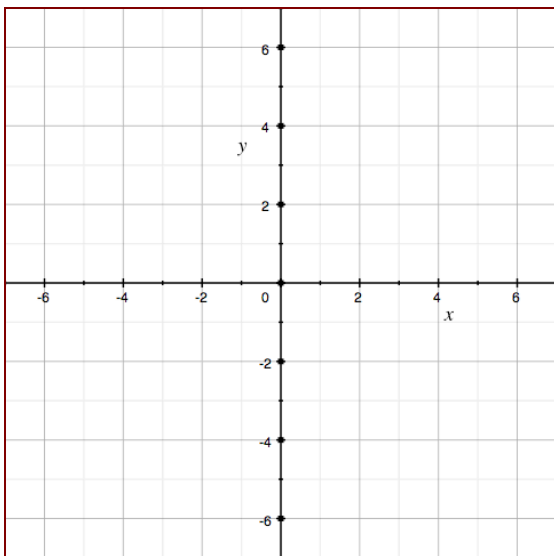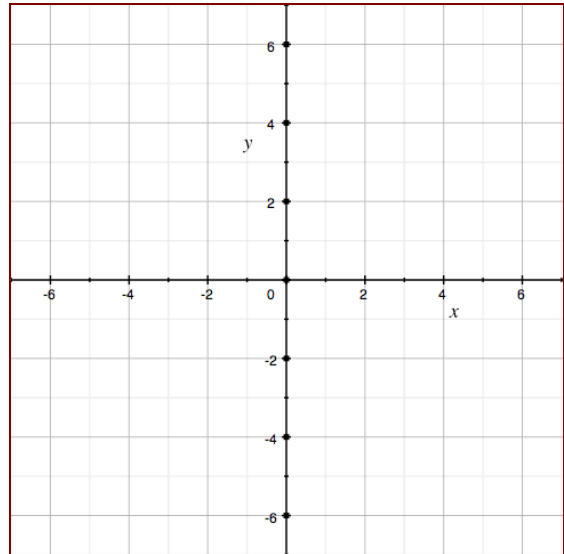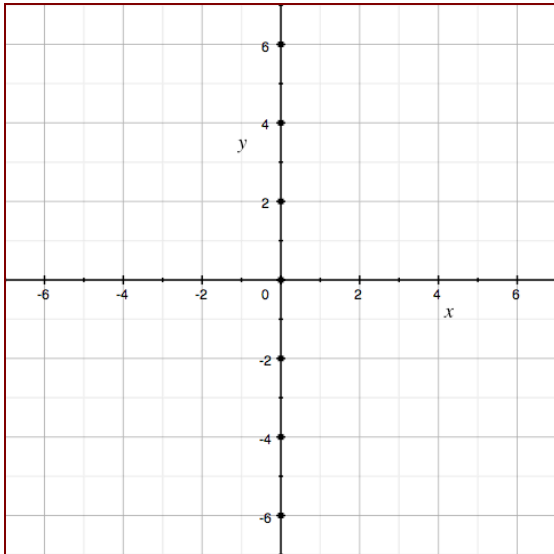
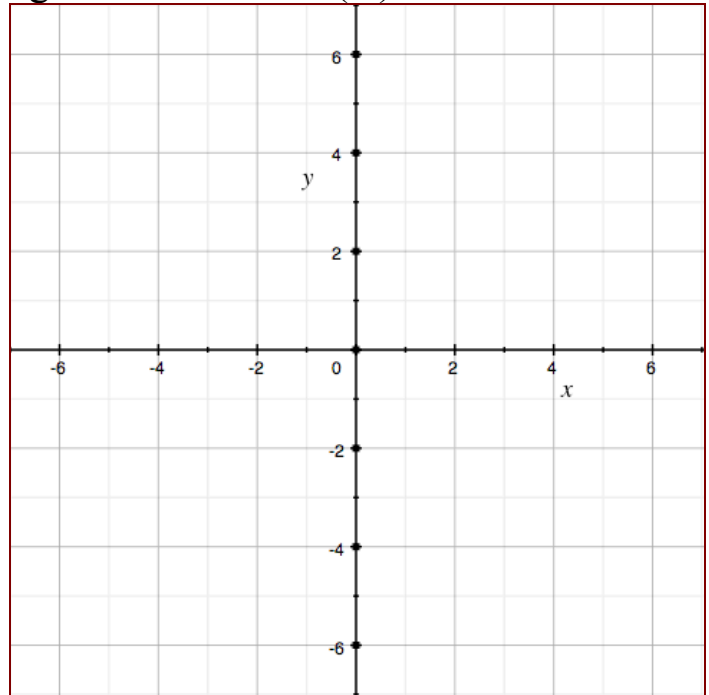II – Let f be the Exponential function defined by $y = e^x$ and (E) be the graphic representation of it an normal rectangular system.

1) Draw the curve (G) of the Symmetrical of (E) through the Axis $y = 2$
2) Find the equation of the function g associated with (G).

3) Knowing that the Reciprocal function of Exp. is called the Natural Log. written ln : $[y = e^x \iff x = ln\ y]$ $(y > 0)$.

   a. Draw the graph of the function represented by the symmetrical through the 1st bisector of the defined by $y = 4 - e^x = g(x)$
   b. Find the reciprocal function of g [give the expression of $g^{-1}(x)$]
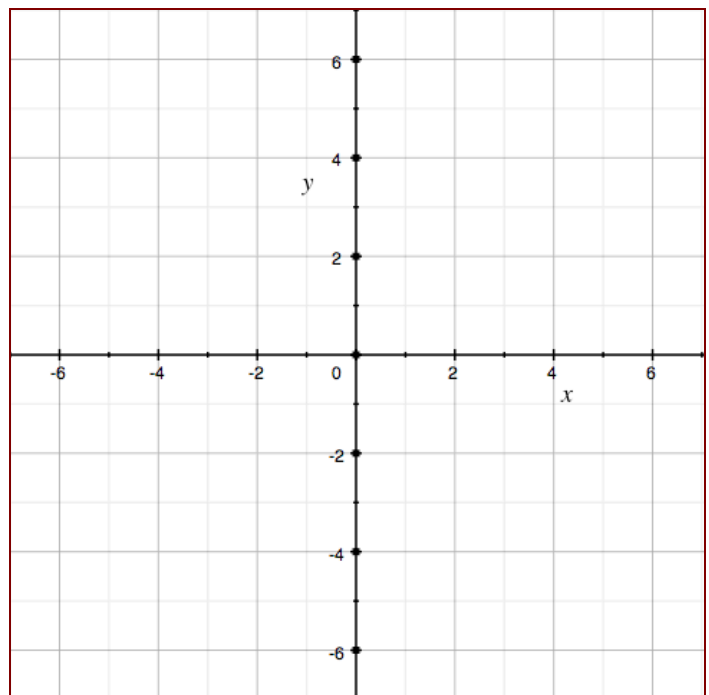
III – Give a formal demonstration to prove that the two functions f and g
defined by the following equations have their graph symmetrical through
the [Oy) Axis.

$$f(x) = a^x \quad ; \quad g(x) = \left(\frac{1}{a}\right)^x$$

Draw the graphs for $a = 2$.
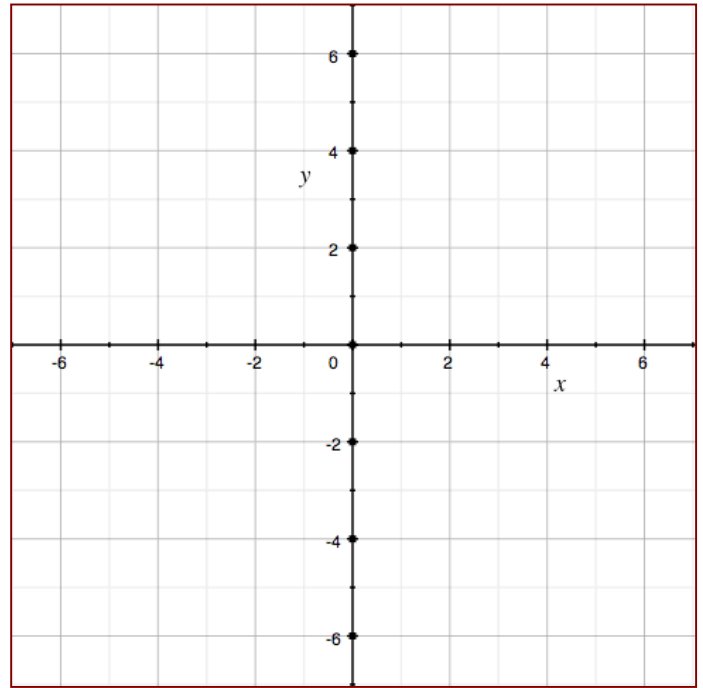
IV- Let $y = f(x) = \dfrac{x-5}{x-1}$.

1) Draw the graph of f.
2) Find the Reciprocal function g of f (specify the intervals of definition).
3) What conclusion can you draw from the above results ?

November 16, 2009