MAC 1140
LA sessions

Week 7

1. Graph given functions using transformations. Start with the basic function. Plot accurately at least 3 point and use them to perform transformations. Do one transformation at a time and write the equation for the functions in intermediate steps. Don't forget to draw the asymptotes!

a) $f(x) = 3 \cdot 2^{-x+1}$

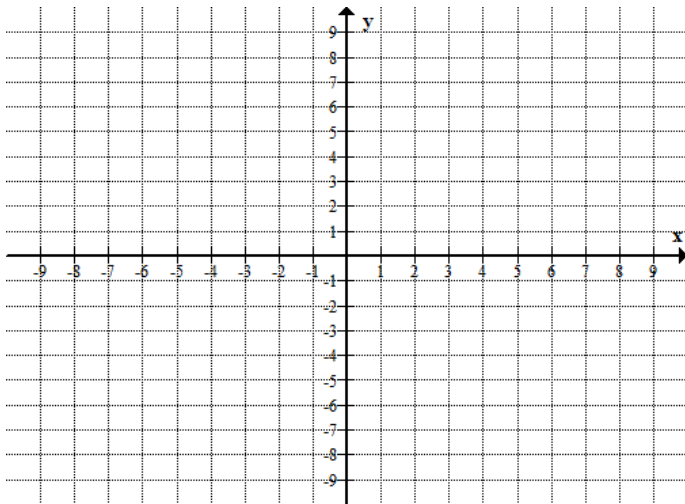b) $f(x) = -e^{2x} - 3$

2. Solve the following equations
a) $4^{2x-1} = 16^{3x}$
b) $7^{x^2-2} = 49^x$
c) $3^{x+6} \cdot 9^x = 27^{x^2}$

3. Graph the following function
$$f(x) = \begin{cases} x^2 - 1 & , x < 0 \\ -3^x & , x \geq 0 \end{cases}$$

4. Find two functions f and g such that h(x) = f(g(x)), where
a) $h(x) = e^{x^2-1}$

b) $h(x) = \ln\left(\dfrac{x-1}{x+4}\right)$

5. Use the properties of exponents to find value of a^{-2x} knowing that $a^x = 3$.

6. In your own words, explain what $\log_2 5$ is.

7. Find the domain of the following functions

a) $f(x) = \log_4(x^4 + 2x^3 - 8x^2)$

b) $f(x) = \ln\left(\dfrac{x+6}{x^2-3}\right)$

8. Graph given functions using transformations. Start with the basic function. Plot accurately at least 3 point and use them to perform transformations. Do one transformation at a time and write the equation for the functions in intermediate steps. Don't forget to draw the asymptotes

a) $f(x) = \log_3(2x+1) + 3$

b) $f(x) = -2\log_2(x-4)$

9. Graph the following function

$$f(x) = \begin{cases} 2^x + 1 & , x < 1 \\ \log_3 x & , x \geq 1 \end{cases}$$
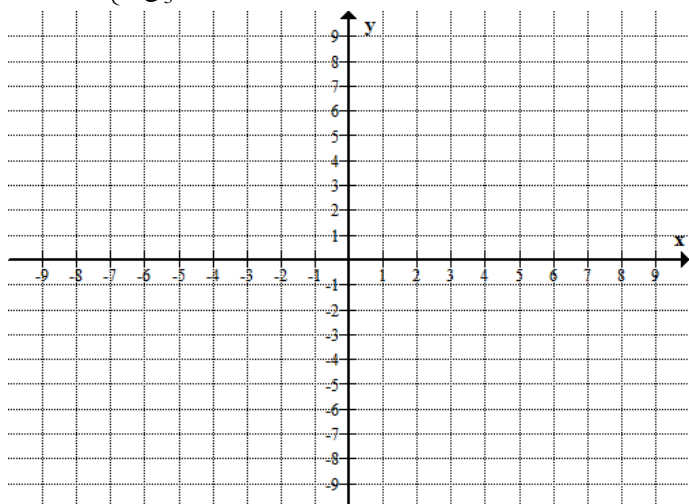
10. Solve the following equations. Give exact values. Do not use a calculator.

a) $\log_2\left(\dfrac{x+1}{x+4}\right) = 1$

b) $3e^{x+1} = 8$

11. Graph the following functions and determine whether they have the inverse. Justify your answer. If a function have the inverse, graph the inverse, find its formula and find the domain and range of the function and its inverse.

a) $f(x) = 2\ln(x+1) - 3$

b) $f(x) = -3^{-x} + 4$

c) $f(x) = e^{x+1} , x \geq -2$