## HOMEWORK 5 - MATH 112 DUE DATE: Monday, October 24 INSTRUCTOR: George Voutsadakis

Read each problem very carefully before starting to solve it. One part of each problem will be chosen at random and graded. Each question is worth 1 point. It is necessary to show your work. Correct answers without explanations are worth 0 points.

## GOOD LUCK!!

- 1. Solve the following exponential equations:
  - (a)  $(\frac{1}{5})^{2x} = 625$
  - (b)  $(x+3)^{4/3} = 16$
- 2. Use transformations to graph the function  $f(x) = 3^{x-2} 5$ .
- 3. Solve the equations:

(a) 
$$e^{-1/x} = \sqrt{e}$$
  
(b)  $x^{2/3} = \sqrt[3]{e^2}$ 

- 4. Use transformations to graph the function  $f(x) = -e^{x+1} 2$ .
- 5. Find the derivative of the following functions:

(a) 
$$f(x) = e^{\sqrt{x}}$$

(b) 
$$g(x) = 4x^3 e^{-x}$$

- (c)  $h(x) = x^2 e^x 2x e^x + 2e^x$
- 6. Find the equation of the tangent line to the graph of  $f(x) = (e^{2x} + 1)^3$  at (0, 8).
- 7. Study the function  $f(x) = x^2 e^{-x}$ .
- 8. (a) Use transformations to graph the function  $f(x) = \ln(x+2) 3$ 
  - (b) Use properties of logarithms to expand the expression  $\ln\left[\frac{3\sqrt{x}(x+1)}{(2x+1)^5}\right]$  and to contract the expression  $\frac{1}{3}\left[2\ln(x+3) + \ln x \ln(x^2-1)\right]$ .