

By providing my signature below I acknowledge that this is my work, and I did not get any help from anyone else:

Name (sign): _____

Name (print): _____

Student Number: _____

Instructor's Name: _____

Meeting Time: _____

Problem Number	Points Possible	Points Made
1	15	
2	15	
3	15	
4	20	
5	20	
6	15	
Total:	100	

- If you need extra space use the last page.
- Please show your work. **An unjustified answer may receive little or no credit.**
- Your work must be **neat**. If I can't read it (or can't find it), I can't grade it.
- The total number of possible points that is assigned for each problem is shown here. The number of points for each subproblem is shown within the exam.
- Please turn off your mobile phone.
- You are only allowed to use a TI-30 calculator. No other calculators are permitted. You are not permitted to share a calculator or any other materials with anyone else during the test.

1. For each expression below determine the values of x that satisfy each expression.

(a) [5 pts] $3x^2 - 5x = -2$

(b) [5 pts] $\ln(6x - 4) = 3$

(c) [5 pts] $3^x = 5^{4x-8}$

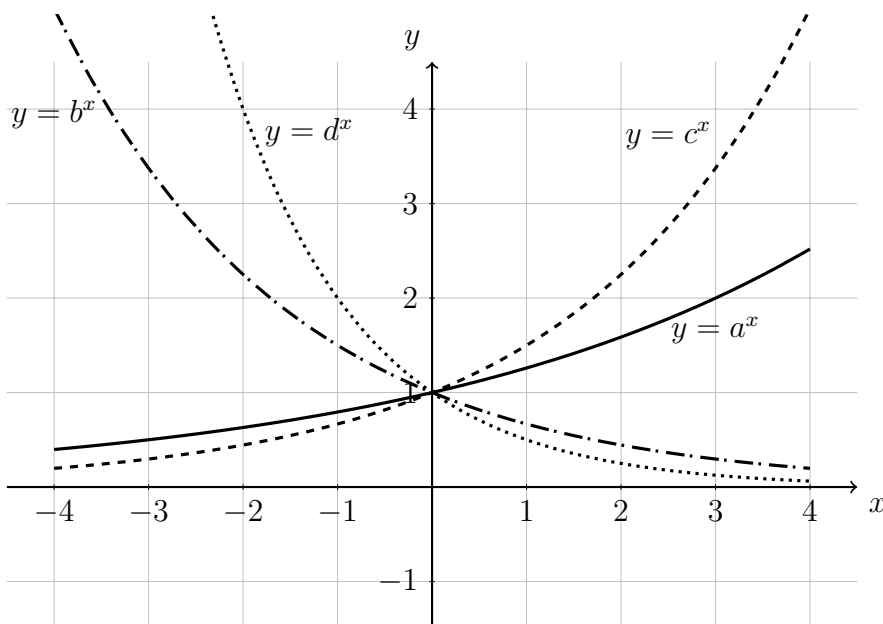
2. Determine the inverse of each of the following functions.

(a) [5 pts] $f(x) = 3x + 1$

(b) [5 pts] $h(x) = \ln(2x + 1) - 8$

(c) [5 pts] $g(x) = \frac{e^{3x} - 5}{e^{3x}}$

3. The questions below refer to the following plot.



(a) [5 pts] What is the value of a ?

(b) [5 pts] What is the value of d ?

(c) [5 pts] List a , b , c , and d in order from lowest to highest. (For example: $a < b < c < d$ would indicate that a has the smallest value and d has the largest value.)

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4. Ten kilograms of plant material is left to decay in a sample. The amount of material at a given time in the sample is approximated using an exponential function, and the amount of material is reduced by half every thirty-six hours.

(a) [10 pts] Determine how much material will be present after three days.

(b) [10 pts] How long will it take until only one kilogram of plant material is left in the sample?

5. [20 pts] A new account at a bank is opened, and initially it contains \$1,000. The interest is compounded monthly. For the first year the interest rate is 1.5%, and after the first year the interest rate is reduced to 1.25%. Determine how long it will take until the balance doubles from the initial amount.

6. [15 pts] Two square animal pens will be constructed for a petting zoo at the local park. The first pen will be for rabbits and requires a fence that costs \$3 per meter. The second pen will be for goats and requires a fence that costs \$6 per meter. The pens will be constructed by Ron Swanson, who is not happy that the government will spend a total of \$1,000 to construct the two pens. What dimensions will he use that will result in the smallest possible combined area?

Extra space for work. If you want us to consider the work on this page you should write your name, instructor and meeting time below.

Name (print): _____ Instructor: Name (print): _____ Time: _____