

Math 105 — First Midterm

October 10, 2011

Name: _____

Instructor: _____ Section: _____

1. **Do not open this exam until you are told to do so.**
 2. This exam has 12 pages including this cover. There are 7 problems. Note that the problems are not of equal difficulty, so you may want to skip over and return to a problem on which you are stuck.
 3. Do not separate the pages of this exam. If they do become separated, write your name on every page and point this out to your instructor when you hand in the exam.
 4. Please read the instructions for each individual problem carefully. One of the skills being tested on this exam is your ability to interpret mathematical questions, so instructors will not answer questions about exam problems during the exam.
 5. Show an appropriate amount of work (including appropriate explanation) for each problem, so that graders can see not only your answer but how you obtained it. Include units in your answer where that is appropriate.
 6. You may use any calculator except a TI-92 (or other calculator with a full alphanumeric keypad). However, you must show work for any calculation which we have learned how to do in this course.
 7. If you use graphs or tables to find an answer, be sure to include an explanation and sketch of the graph, and to write out the entries of the table that you use.
 8. **Turn off all cell phones and pagers**, and remove all headphones.
 9. You must use the methods learned in this course to solve all problems.
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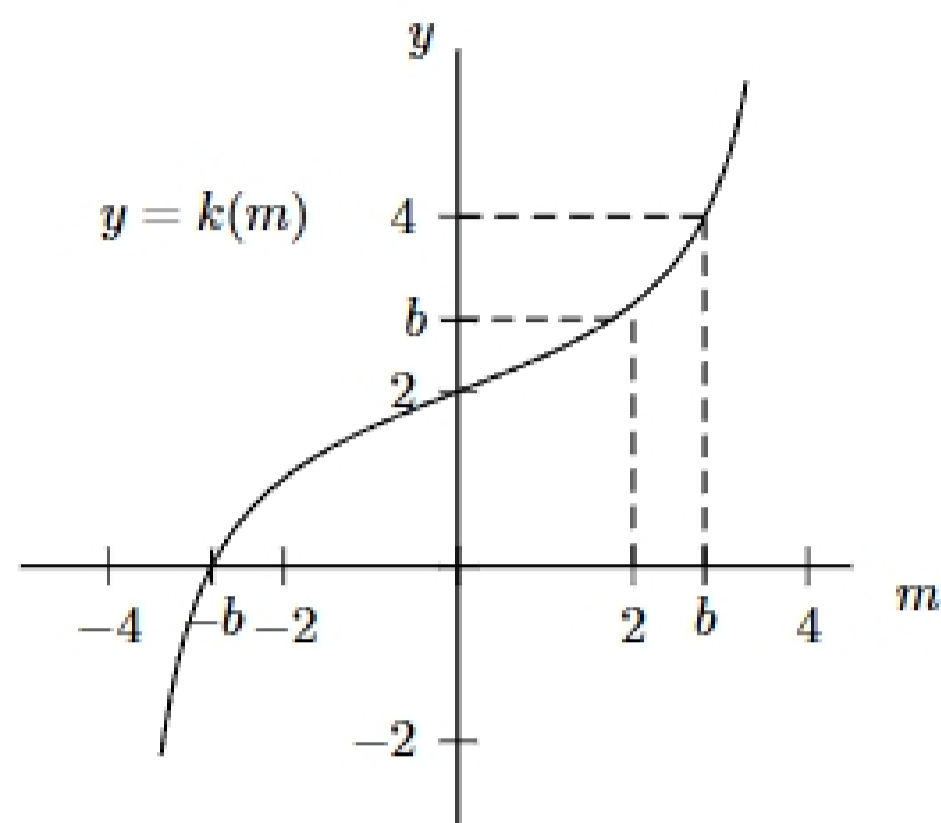
Problem	Points	Score
1	20	
2	10	
3	10	
4	16	
5	16	
6	18	
7	10	
Total	100	

1. [20 points] Use the functions g , h , p , and k given below to answer the questions that follow.
Note: Some answers may involve the constant b .

t	-4	-2	0	2	4	6
$g(t)$	4	b	2	1	-2	$-b$

$$h(y) = \frac{2^y}{y^2 + 1}$$

$$p(x) = \begin{cases} (x+4)^2 - 5 & \text{for } -3 \leq x \leq -1 \\ 1.2(0.2)^x & \text{for } x > -1 \end{cases}$$



- a. [2 points] Evaluate $p(-1) + p(1)$.
- b. [2 points] Evaluate $p(k(0))$.
- c. [2 points] Evaluate $h(g(-2) + 2)$.
- d. [2 points] Solve $k(m) = b$ for m .
- e. [2 points] Assume g and k are invertible. Evaluate $g^{-1}(-2) + k^{-1}(0)$.

This problem continues on the next page.

This is a continuation of the problem from the previous page.

Recall that $h(y) = \frac{2^y}{y^2 + 1}$ and $p(x) = \begin{cases} (x + 4)^2 - 5 & \text{for } -3 \leq x \leq -1 \\ 1.2(0.2)^x & \text{for } x > -1. \end{cases}$

- f. [3 points] Find the domain of h . Use either inequalities or interval notation to give your answer. Please remember to show your work.

Domain:

- g. [3 points] Find the domain of p . Use either inequalities or interval notation to give your answers. Please remember to show your work.

Domain:

- h. [4 points] Find the range of p . Use either inequalities or interval notation to give your answers. Please remember to show your work; this includes sketching any graphs you use.

Range: