By providing my signature below I acknowledge that I abide by the University's academic honesty policy. This is my work, and I did not get any help from anyone else during the exam:

Name (sign): _____ Name (print): _____

Student Number: _____

Instructor's Name: _____ Class Time: _____

Problem Number	Points Possible	Points Made
1	14	
2	21	
3	7	
4	7	
5	14	
6	11	
7	11	
8	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.**
- If you make use of a theorem to justify a conclusion then state the theorem used by name.
- 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.
- A calculator is not necessary, but numerical answers should be given in a form that can be directly entered into a calculator.

1. Use the function below to answer the following:

$$f(x) = \frac{13 - 2x}{22 + 5x}$$

(a) [7 pts] Determine $f^{-1}(x)$.

(b) [7 pts] Determine the range of $f(x)$. Give your answer in interval notation.

Points earned: _____
out of a possible 14 points

2. Use the function below to answer questions 2(a), 2(b), and 2(c).

$$f(x) = \frac{\log_5(x+8) - 1}{x^2 - 8}$$

(a) [5 pts] Determine the **y-intercept(s)** of $f(x)$. Give a decimal value correct to 4 places.

(b) [6 pts] Determine the **x-intercept(s)** of $f(x)$.

(c) [10 pts] Determine the **domain** of $f(x)$. Give your answer in interval notation.

Points earned: _____
out of a possible 21 points

3. [7 pts] Let $f(x) = -12 + \frac{3}{5}(4)^{3-2x}$. Determine the value of $f^{-1}(2)$.

4. [7 pts] Suppose that $\log_c(p) = 3.4$ and that $\log_c(q) = 2.6$. Determine the numeric value for the expression below:

$$\log_c\left(\frac{c^2\ q^4}{p^7}\right)$$

Points earned: _____
out of a possible 14 points

5. Solve for x for the following equations, or explain why an answer does not exist.

(a) [7 pts] $e^{2x} - 2e^x - 35 = 0$

(b) [7 pts] $\ln(3x) - \ln(2x + 3) = 2$

Points earned: _____
out of a possible 14 points

6. [11 pts] A bank account compounds continuously at a rate of 3.2%. Assuming no deposits or withdrawals are made, determine the initial balance needed in order for the account to grow to \$52,000 in 30 years. Give an exact answer or an answer correct to the nearest cent.

7. [11 pts] A bank account compounds twice a month at an annual rate of 2.2%. Assuming no deposits or withdrawals are made, determine how long it will take for the account balance to triple. Give an exact answer, or an answer correct to four decimal places.

Points earned: _____
out of a possible 22 points

8. [15 pts] The amount of a radioactive compound in a sample decays exponentially. The sample initially contains 110g of the compound, and after three years contains 83g. How long will it take until there is only 55g of material remaining? Give an exact answer, or an answer correct to two decimal places.

Points earned: _____
out of a possible 15 points

Extra space for work. **Do not detach this page.** If you want us to consider the work on this page you should print your name, instructor and class meeting time below.

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

Points earned: _____
out of a possible 0 points