

Your Name (please PRINT clearly)

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Quiz Section

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Student ID #

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PLEASE READ DIRECTIONS BELOW:

- Do not open the test until instructed to do so. Once the exam starts, check that you have a complete exam. i.e. that you have 4 pages with problems, in addition to this coversheet.
- This exam is closed book. You may use one $8\frac{1}{2} \times 11$ page of handwritten notes. Do not share notes.
- Only a Ti-30x IIS calculator is allowed.
Turn off your cell phone and put it away until the exam is over.
- If you need more room, use the backs of pages and indicate to the grader that you have done so.
- Unless otherwise stated, you **MUST SHOW YOUR WORK**. Answers with incorrect or missing supporting work may result in little or no credit, even if the answer happens to be correct.
- Place a box around YOUR FINAL ANSWER to each question.
- You may leave your answers in exact form, or round them off to 2 or more decimal digits.
Keep at least 4 digits of precision throughout your computations, and **DO NOT ROUND** bases of exponential functions.
- Read each question carefully, before and after answering it. Do your best, and show your work.
Good luck!

Problem	Points	Score
1	14	
2	6	
3	6	
4	12	
5	12	
Total	50	

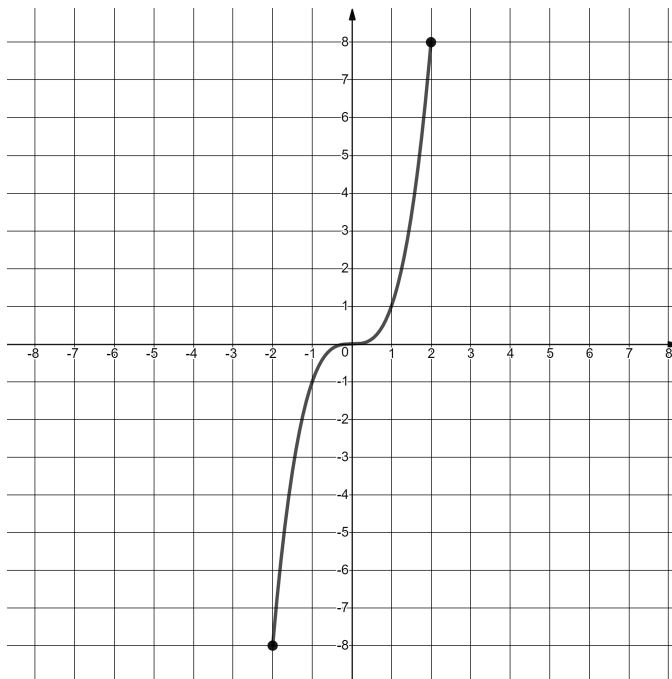
1. (14 points) Dr. Frankenstein is growing two types of super-bacteria in his secret lab: A and B.

- Bacteria A's population grows by 10% every hour. At midnight, he had 5000 bacteria of type A.
- Bacteria B's population triples every 5 hours. At 1:00 AM, he had 1000 bacteria of type B.

When will Dr. Frankenstein have twice as many bacteria B as bacteria A? Round to the nearest minute.

2. (6 points) The following is the graph of a function $F(x)$, with domain $-2 \leq x \leq 2$.

On the same grid, sketch the graph of its inverse function, $F^{-1}(x)$. Also, specify its domain and range.



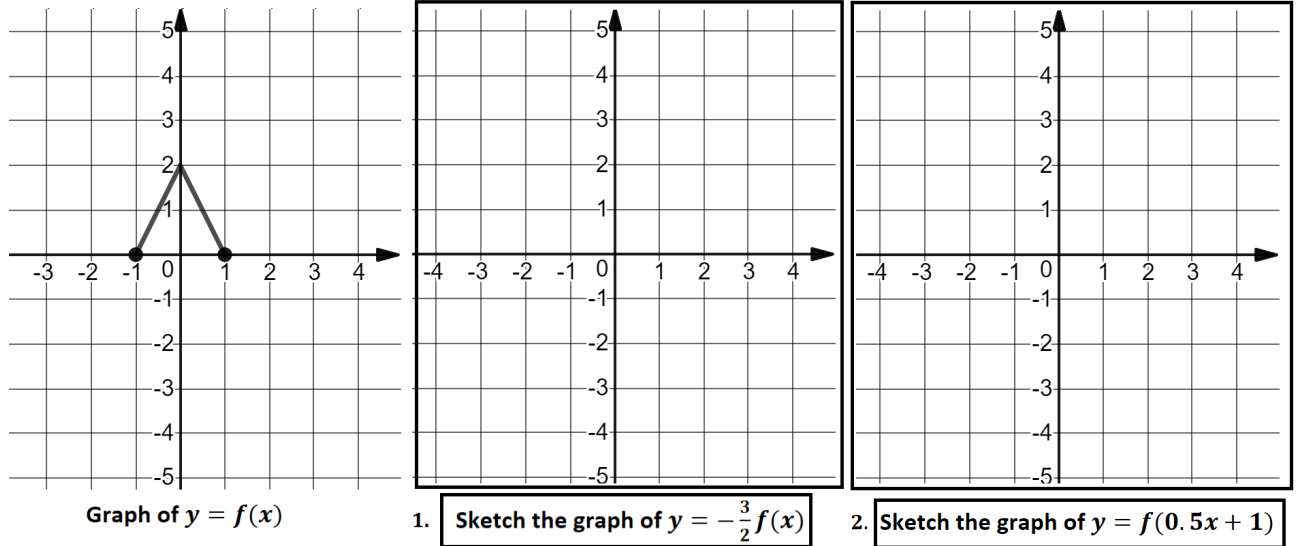
The domain of F^{-1} is: _____, and the range of F^{-1} is: _____

3. (6 points) Consider the function $G(x) = -3x^2 + 18x$, with domain $x \geq 3$. Find the rule for $G^{-1}(x)$.

4. The graph of a function $y = f(x)$ with domain $-1 \leq x \leq 1$ is shown on the left below.

(a) (6 points) Draw the graphs of the two indicated functions in the boxed areas below.

Use the first grid for scratch work or intermediate steps – be neat and clear in the boxed areas.



(b) (6 points) For the same function $f(x)$ shown above left, determine the constants A, B for which the range of $Af(x) + B$ is $[-1, 3]$.

5. (12 points) Solve the following equations. Show your steps and box your final answer.

(a) $3 \cdot 5^{2x} - 7 = 1$

(b) $\ln(x^2 - 3) = 0$

(c) $\log_2(x + 1) - \log_2(x) = 3$