Math 120 C Midterm 3

NAME (First,Last) : .....

UW email: .....

Student ID .....

- Please use the same name that appears in Canvas.
- IMPORTANT: Your exam will be scanned: DO NOT write within 1 cm of the edge. Make sure your writing is clear and dark enough.
- Write your NAME (first, last) on top of the second page of this exam.
- If you run out of space, continue your work on the back of the second page and indicate clearly on the problem page that you have done so.
- Unless stated otherwise, you **MUST** show work for credit.
- Your work needs to be neat and legible.
- Unless the problem gives you different instructions, you can give exact answers or round off your answers to 2 decimal places.
- The only calculator allowed is the TI 30X IIS. You are allowed an 8x11 sheet of notes, written both sides.
- Box your final answer, when appropriate.
- Raise your hand if you have a question.

1. University A had 20,000 students in 2010; enrollment at University A doubles every 100 years. In 2015 University B had 15,000 students; the number of students enrolled in University B increases 30 % every 20 years. When will University B have two times as many students as University A ? Round to the nearest integer and give your answer as a year, ex: 2027.

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2. Suppose $y = f(x)$ is a function with domain $-6 \leq x \leq 2$ and range $-1 \leq y \leq 3$ and $g(x) = -f(\frac{x}{3} + 2) - 7$.

   (a) List the graphical operations, in a correct order, needed to transform the graph of f into the graph of g. (By graphical operations I mean shifts, reflections and scalings. Be precise, for example say something like *horizontal shift to the right of 7 units* , or *reflection around the x axis* or *vertical scaling of a factor $c = 7$*).

   (b) Find the domain and range of g.

Extra credit: Suppose you know f(-6)=3 and that f is invertible. What is g(0) ? Justify your answer.