Math 120
Practice Exam A
November 2025

- This exam is a collection of old exam 2 questions from either Fall 2009 Loveless or Spring 2022 Ostroff.
- Solutions to those exams can be found in the exam archive, but also here are links:
  - https://sites.math.washington.edu/ m120/Aut09/loveless/
  - Spring 2022 Solutions: https://sites.math.washington.edu/ m120/Spr22/ostroff/
- This should NOT be your only source of studying but I hope this helps.
- Instructions are given below as a reminder of what exams look like.

Name _____

Student ID #_____

Section _____

HONOR STATEMENT

"I affirm that my work upholds the highest standards of honesty and academic integrity at the University of Washington, and that I have neither given nor received any unauthorized assistance on this exam."

SIGNATURE:_____

- This exam consists of this cover, four pages of questions, and a blank scratch page.
- You will have 50 minutes.
- You may use a Ti-30x IIS calculator (no other models) and one 8.5×11 inch sheet of handwritten notes (front and back).
- Turn your cell phone OFF and put it away for the duration of the exam. You may not listen to headphones or earbuds during the exam.
- **You must show your work.** Correct answers with no supporting work may receive no credit.
- Leave answers in exact form or round to three digits after the decimal, unless otherwise specified.
- **Do not write within 1 cm of the edge.** Exams are scanned for grading.
- There may be multiple versions. Do not cheat. If your answer matches another version with no supporting work, you will receive a zero and be reported.
- Alternate text for any image is given at the bottom of the page where the image appears.

GOOD LUCK!

Fall 2009 Loveless Exam 2 Problem 4

1. The human population of the city of Boom is growing exponentially. Let x be the years since 2000 and $B(x)$ be the human population in Boom.
   In 2000 (x=0), the human population of Boom was 1250.
   The human population of Boom doubles every 5 years.

   (a) Give the value of x when the population of Boom will be 15,000.

   (b) As more people inhabit the city, the population of deer within the city limits is decreasing according to an exponential model.
   In 2003 (x=3), the population of deer was 9000. In 2006, the population of deer was 8000.
   For what value of x will there be twice as many people as deer.

Fall 2009 Loveless Exam 2 Problem 1

2. Lily's height, y, is a **linear-to-linear rational** function of her age, x.
   At age 2, she is 35 inches tall.
   At age 10, she is 55 inches tall.
   As she gets older and older, her height increases and approaches (but never exceeds) 64 inches.

   (a) Find the linear-to-linear model for height, y, in terms of age, x.

   (b) At what age is Lily exactly 50 inches tall?

Spring 2022 Ostroff Exam 2 Problem 4

3. For each part of this question, let $f(x) = 3\log_2(x) + 2$.

   (a) Find a formula for $f^{-1}(x)$.

   (b) Suppose $f(f(x)) = 11$. What's x?

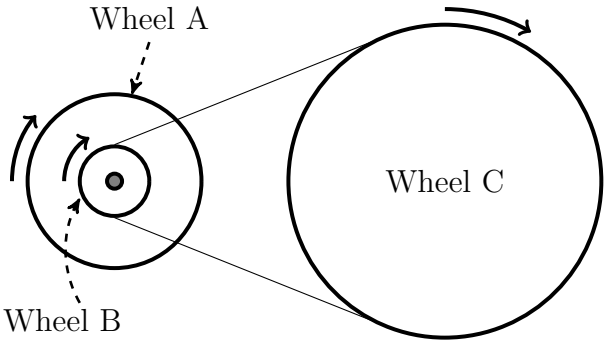
   (c) Let $g(x) = \log_2(x)$. What transformations (shifting, scaling, reflecting) will lead you from the graph of $y = g(x)$ to the graph of $y = f(x)$?

   Fill in the blanks:

   - First, you _____.
   - Then, you _____.

Spring 2022 Ostroff Exam 2 Problem 3

4. Three wheels are connected as shown in the diagram below: Wheels A and B are connected by an axle, and Wheels B and C are connected by a belt.



Wheel A has a radius of 5 meters, and rotates at a linear speed of 10 meters per second.

Wheel C has a radius of 8 meters, and takes 9 seconds to make one complete rotation.

What is the radius of wheel B?