

Math 120
Practice Exam C
November 2025

- This exam is a collection of old Exam 2 questions (this version draws from *Winter 2018 Ostroff* and *Winter 2017 Conroy*).
- Solutions to source exams are available in the Math 120 archive.
- 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!

Winter 2018 Ostroff Exam 2 Problem 1

1. I have placed some plums in an icebox. Their temperature (in Celsius) is an exponential function of time.

10 hours from now, the plums will be at a temperature of 11° Celsius.

22 hours from now, they will be at a temperature of 5° Celsius.

- (a) Write a function $p(t)$ for the temperature of the plums (in degrees Celsius) t hours from now.

- (b) I will eat the plums when their temperature reaches 4° Celsius. How many hours from now is this?

Winter 2018 Ostroff Exam 2 Problem 3

2. Shuri is developing a shock-absorbing material. The amount of energy it can absorb is a linear-to-linear rational function of how long Shuri conducts her research.

Right now, the material can absorb 2 megajoules of energy.

If she researches for 2 more days, it will be able to absorb 2.8 megajoules.

As Shuri's research continues, the amount of energy the material is able to absorb will approach (but not reach) 5 megajoules.

- (a) Write a linear-to-linear rational function $f(x)$ for the amount of energy the material can absorb, in megajoules, if Shuri researches for x days.

- (b) Find the inverse of the function you found in part (a).

Winter 2017 Conroy Exam 2 Problem 2

3. (a) Let $g(x) = x^2 + 6x + 3$ for $x \leq -3$. Find $g^{-1}(x)$.

(b) Let $f(x) = 3x - 1$ and $h(x) = x^2 - 2$. Find the fixed points of $f(h(x))$.

Reminder: a fixed point is a solution to $G(x) = x$; here $G(x) = f(h(x))$.

4. Check out these wheels:

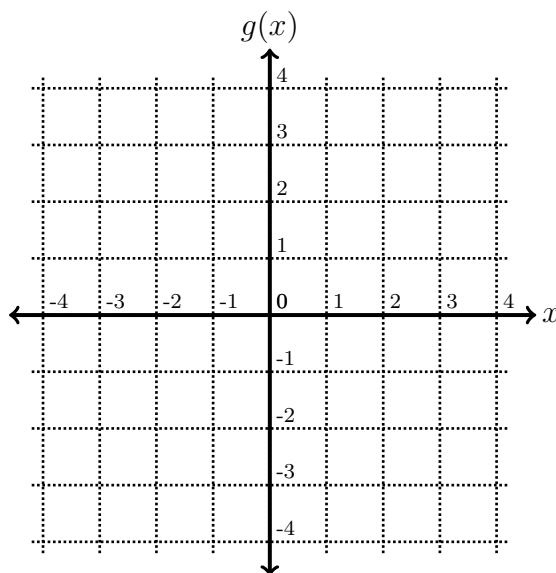
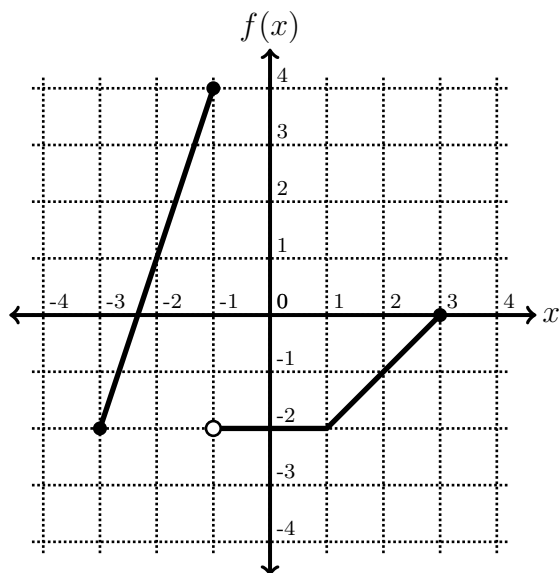
Wheel A has a radius of 3 inches and makes 2 revolutions per minute.

Wheel B is connected by a belt to wheel A, and by an axle to wheel C.

Wheel C has a radius of 5 inches and rotates at a speed of 10 inches per minute.

What's the radius of wheel B?

5. On the left is the graph of $f(x)$. On the right, please graph $g(x) = \frac{1}{2}f(x - 1) - 1$.



Alt text: Left grid shows a piecewise linear $f(x)$ with a segment from $(-3, -2)$ to $(-1, 4)$, an open circle at $(-1, -2)$, a segment to $(1, -2)$, then to $(3, 0)$. Right grid is blank for $g(x)$.