CS 70 Discrete Mathematics and Probability Theory
Fall 2025 Sabin, Hug

HW 00

Due: Saturday, 8/30, 4:00 PM
Grace period until Monday, 9/01, 11:59 PM
Remember to show your work for all problems!

Sundry

Before you start writing your final homework submission, state briefly how you worked on it. Who else did you work with? List names and email addresses. (In case of homework party, you can just describe the group.) If you used an LLM, place transcripts of your chats here.

First name	Walter
Last name	Cheng
SID	3040523853
Collaborators	

1 Administrivia

(a) Make sure you are on the course Ed (for Q&A) and Gradescope (for submitting homeworks, including this one). Find and familiarize yourself with the course website. What is its homepage's URL?

https://www.eecs70.org/

(b) Read the policies page on the course website.

(i) What is the breakdown of how your grade is calculated?

- 5% Discussion Attendance
- 5% Mini-Vitamins (top 13 scores)
- 15% Homework (lowest 3 scores dropped)
- 30% Midterm
- 45% Final Exam

(ii) What is the attendance policy for discussions?

Must attend at least 13 discussion sections to receive full credit.

(iii) When are homeworks released, and when are they due?

Homeworks are released on Sundays and are due the following Saturday at 4:00pm, with a grace period until Saturday 6:00pm.

(iv) How many "drops" do you get for homeworks? How many mini-vitamins will contribute to your grade?

Lowest 3 homeworks are dropped, and 13 mini-vitamins will be taken into account for the final grade.

(v) When is the midterm? When is the final?

Midterm: Thursday, 10/16/2025 from 7:00pm - 10:00pm
Final: Friday, 12/19/2025 from 7:00pm - 10:00pm

(vi) What percentage score is needed to earn full credit on a homework?

Homework scores are out of 73%.

2 Course Policies

Go to the course website and read the course policies carefully. Leave a followup on Ed if you have any questions. Are the following situations violations of course policy? Write "Yes" or "No", and a short explanation for each.

(a) Alice and Bob work on a problem in a study group. They write up a solution together and submit it, noting on their submissions that they wrote up their homework answers together.

Yes; per the policies page: "you must always write up the solutions on your own".

(b) Carol goes to a homework party and listens to Dan describe his approach to a problem on the board, taking notes in the process. She writes up her homework submission from her notes, crediting Dan.

No; Carol was at a homework party, Dan discussed his approach, and Carol wrote her own submission and gave credit.

(c) Erin comes across a proof that is part of a homework problem while studying course material. She reads it and then, after she has understood it, writes her own solution using the same approach. She submits the homework with a citation to the website.

No; per the policies page, "you may use books or online resources to help solve homework problems". Erin did not copy the proof verbatim and wrote her own solution, and credited her source for the approach.

(d) Frank is having trouble with his homework and asks Grace for help. Grace lets Frank look at her written solution. Frank copies it onto his notebook and uses the copy as a reference to write and submit his homework, crediting Grace.

Yes; students can discuss approaches, but Grace did not collaborate with Frank, he just read her solution.

(e) Heidi has completed her homework using LaTeX. Her friend Irene has been working on a homework problem for hours, and asks Heidi for help. Heidi sends Irene her PDF solution, and Irene uses it to write her own solution with a citation to Heidi.

Yes; again, there is no collaboration, and Irene is looking at a solution rather than discussion approaches.

(f) Joe found homework solutions before they were officially released, and every time he got stuck, he looked at the solutions for a hint. He then cited the solutions as part of his submission.

Yes; per the policies: "using any kind of homework or exam solutions... on a currently active assignment is strictly prohibited and is academic misconduct".

(g) Kai is struggling with one of their homework problems, so they take a screenshot of the problem and ask ChatGPT to solve it for them. They adapt ChatGPT's response to their own

solution, and they include a link to their ChatGPT conversation in the homework's Sundry section.

Yes; per the policies page: "you may not directly ask a model to solve the question for you".

3 Use of Ed

Ed is incredibly useful for Q&A in such a large-scale class. We will use Ed for all important announcements. You should check it frequently. We also highly encourage you to use Ed to ask questions and answer questions from your fellow students.

(a) Read the Ed Etiquette section of the course policies and explain what is wrong with the following hypothetical student question: "Can someone explain the proof of Theorem XYZ to me?" (Assume Theorem XYZ is a complicated concept.)

- The theorem proof is likely from a note or lecture, so this post should have been made in its relevant thread.
- The theorem should be stated in the question, so that TAs/responders don't have to find where the theorem is mentioned in the notes.
- Since theorem XYZ is complicated it likely would take more than 5 minutes to explain its proof, so the student should go to office hours for help.

(b) When are the weekly posts released? Are they required reading?

Weekly posts are made every Monday on Ed, and they are required reading.

(c) If you have a question or concern not directly related to the course content, where should you direct it?

These concerns should be emailed to fa25@eecs70.org

4 Academic Integrity

Please write or type out the following pledge in print, and sign it.

> I pledge to uphold the university's honor code: to act with honesty, integrity, and respect for others, including their work. By signing, I ensure that all written homework I submit will be in my own words, that I will acknowledge any collaboration or help received, and that I will neither give nor receive help on any examinations.

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x Walter Cheng

5 Propositional Practice

Note 1

In parts (a)–(b), convert the English sentences into propositional logic. In parts (c)–(d), convert the propositions into English. For parts (b) and (d), use the notation $a \mid b$ to denote the statement "a divides b", and use the notation $P(x)$ to denote the statement "x is a prime number".

(a) For every real number k, there is a unique real solution to $x^3 = k$.

$\forall k \in \mathbb{R}, \exists x \in \mathbb{R}$ s.t. $(x^3 = k) \wedge (\forall y \in \mathbb{R} \setminus \{x\}, y^3 \neq k)$.

(b) If p is a prime number, then for any two natural numbers a and b, if p doesn't divide a and p divides ab, then p divides b.

$\forall x \in \mathbb{N}$ s.t. $P(x), \forall a, b \in \mathbb{N}, (p \nmid a) \wedge (p \mid ab) \implies p \mid b$.

(c) $(\forall x, y \in \mathbb{R})[(xy = 0) \implies ((x = 0) \vee (y = 0))]$

For all real numbers x and y, if $xy = 0$ then at least one of x or y is 0.

(d) $\neg((\exists y \in \mathbb{N})[(\forall x \in \mathbb{N})[(x > y) \implies ((y \mid x) \vee P(x))]])$

For all natural numbers y, there is a non-prime number x such that $x > y$ and y doesn't divide x.