



Certificate of Completion

— *This certificate is awarded to* —



Chao XU

In recognition of the dedication in completing the Online Research Seminar

Complex Variables

March 9, 2023

Date



Edison Yan
Academic Committee Chair
Path Academics

Academic Transcript



Student Name: Chao XU

Gender: M

Program Name: Complex Variables Online Research Seminar

Start Date: January 14, 2023

Completion Date: March 4, 2023

Comprehensive Evaluation

<i>Participation</i>	<i>B</i>
<i>Assignment</i>	<i>A</i>
<i>Final Project</i>	<i>A</i>
<i>Total Grade</i>	<i>A</i>



March 22nd, 2023

To whom it may concern,

This letter refers to the performance of Chao XU in the class on Complex Analysis that I taught for Path Academics during the Spring of 2023.

To give an idea of what the student has achieved in this program I start with a description of the subject matter and its typical placement in an undergraduate program such as the one at UC Berkeley.

Complex Analysis is a subject that grew and matured in the period 1800-1900. It deals with the basic notions of mathematical analysis: differentiation and integration-going back to Newton in the context of functions that are defined and take values in the complex plane.

It is one of the crowning accomplishments of classical mathematics, with roots in the earlier work of people such as L. Euler it acquired its definite form in the hands of people such as A. Cauchy, B. Riemann, and K. Weierstrass. It is based on developments in pure and applied mathematics ranging from analytical number theory to fluid dynamics. The most famous open problem in mathematics, the so-called “Riemann hypothesis”, concerns the location of the zeros of a certain function defined in the complex plane. In marked difference with other well-known problems -such as the so-called “Fermat last theorem”, settled not too long ago- its yet unproven validity is an assumption behind a lot of mathematical results. The theory of Riemann surfaces is at the core of many current developments in theoretical physics.

In Berkeley, a one-semester course on Complex Analysis is typically taken by students in their junior or (more commonly) in their senior year. The class that I taught for Path Academics covers somewhere between one-third and two-fifth of the material that I cover at Berkeley.

As a text, I used chapters 1, 2, 3, 4, 5, and 6 of the book Complex Variables and Applications by J. Brown and R. Churchill (9th edition). I had used this book at one point for my classes in Berkeley but subsequently moved to a more “in-depth” text. For the high school audiences in this class, I decided to try this more introductory-level book, which as far as I know, is never available to high school students in the USA.

We had five weeks of lectures and substantial homework, about six problems per week, followed by two weeks devoted to a “special project” based on material from chapter 6 in our text. Here students were supposed to work in groups and solve a challenging problem whose solution required mastering the material in this class. In week number seven they had to present the “special project” and convince me that they had understood their methods and solutions.

Overall, Chao XU’s performance in this program was excellent.

Chao attended all the class sessions on time and shared his ideas with the class during discussions. In addition to his participation, Chao also did a good job on his assignments. He showed quite strong abilities to apply the knowledge learned from class to the homework questions. He could always think independently on tough questions and seek solutions by himself.

In terms of the final “special project”, Chao belongs to group 1. Their performance in the “special project” was excellent and the structure as well as the way they explained their solutions were very good. This remark agrees with the teaching fellow of the course, who considers this group to be excellent.

I hope this letter will be helpful as a reference for you to assess Chao XU’s academic capability.

Sincerely,

A handwritten signature in blue ink that reads "Alberto Grünbaum". The script is cursive and fluid.

Alberto Grünbaum
Prof. of Mathematics
University of California, Berkeley

A handwritten signature in blue ink that reads "Edison Yan". The script is cursive and fluid.

Edison Yan
Senior Advisor, Academic Committee
Path Academics

Certificate of

DISTINCTION

The **CENTRE** for **EDUCATION** in **MATHEMATICS** and **COMPUTING**
is pleased to recognize the achievement of

Chao Xu

who ranked in the top twenty-five percent of contestants in the

Euclid Contest

in the year 2023



IAN VANDERBURGH
Director

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MATHEMATICS and COMPUTING
University of Waterloo
Waterloo, Ontario, Canada



MARK GIESBRECHT
Dean

Faculty of Mathematics
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WATERLOO**



BPhO

British Physics Olympiad

BPhO ONLINE SENIOR PHYSICS CHALLENGE

This certificate is awarded to

CHAO XU

Suzhou Industrial Park Foreign Language School

who achieved a

SILVER AWARD

in the British Physics Olympiad 2023
Online Senior Physics Challenge

Mr Robin Hughes
Chair of the British Physics Olympiad
February 2023



BPhO

British Physics Olympiad

BPhO SENIOR PHYSICS CHALLENGE

This certificate is awarded to

CHAO XU

Suzhou Industrial Park Foreign Language School

who achieved a

BRONZE II AWARD

in the British Physics Olympiad 2023
Senior Physics Challenge for problem solving

Mr Robin Hughes

Chair of the British Physics Olympiad

March 2023



RESEARCH

Certificate of Achievement

This is to certify that:

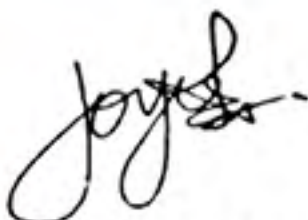
CHAO XU

has attended:

ASDAN CHINA BUSINESS SIMULATION 2022-23

and has been awarded:

GOLD AWARD



Business Program Director
16/04/2023



SASTIC

苏州市青少年科技创新大赛
SUZHOU ADOLESCENTS SCIENCE
AND TECHNOLOGY INVENTION CONTEST

获奖证书

赛事名称: 第34届苏州市青少年科技创新大赛

科技创新成果

参赛项目: 高考物理力学感受解题辅助器(电脑模型以及实物模型)

奖项成绩: 高中组 三等奖

学校全称: 苏州工业园区外国语学校

学生姓名: 杨世泽、徐超、张芮泽

指导教师: 冯帅

证书编号: KJ2023QSNKJCXS0205



苏州市科学技术协会
苏州市教育局

2023年6月

工业园区