

The background of the entire page is a vibrant underwater scene. It features a variety of fish, including a large tiger-striped fish on the left, several smaller blue fish, and a few green and yellow tropical fish. A large shark is positioned at the top left, and a sea turtle swims towards the center. The scene is set against a backdrop of lush green coral reefs and kelp forests, with bubbles rising from the bottom right corner.

The Olympiad Algebra Handbook

Samuel de Araújo Brandão

The Olympiad Algebra Handbook

Samuel de Araújo Brandão

Preface

Acknowledgements

Introduction

Contents

Preface	iii
Acknowledgements	v
Introduction	vii
I Fundamentals	1
II Inequalities	3
1 whatever	5
1.1 AM-GM inequality	5
1.2 Majorization	5
1.3 Muirhead's inequality	5
1.4 Homogenization	5
1.5 Weighted Power Mean	5
1.6 Hölder inequality	5
1.7 Cauchy-Schwarz inequality	5
1.8 Titu's Lemma	5
III Polynomials	7
IV Functional Equations	9
V Algebraic Manipulations	11

Part I

Fundamentals

Part II

Inequalities

Chapter 1

whatever

1.1 AM-GM inequality

Starting with one of the easiest ones, often called the Arithmetic Mean, Geometric Mean inequality.

1.2 Majorization

1.3 Muirhead's inequality

1.4 Homogenization

1.5 Weighted Power Mean

1.6 Hölder inequality

1.7 Cauchy-Schwarz inequality

1.8 Titu's Lemma

Part III

Polynomials

Part IV

Functional Equations

Part V

Algebraic Manipulations

