Professor Chen Education Palace (陈教授教育学院) Phone (电话): 1-626-385-7961
E-mail (电邮): contact@professorchenedu.com Wechat (微信): professorchenedu (陈教授聊数学)

Syllabus for AMC 10/12 Crash Course

(AMC 10/12 考前冲刺班教学大纲)[1]

PROFESSOR CHEN EDUCATION PALACE (陈教授教育学院)

OBJECTIVES (教学目标)

Advance to AIME.

(晋级AIME)

Duration (总课时)

30 Hours (30小时).

TEXTBOOKS (教材)

We use our developed course packet (我们用自己编写的教材).

COURSE CONTENTS (教学内容)

Module 1: Algebra (第一模块：代数)

1. Skills of manipulating math expressions (数学表达式的处理技巧)

(a) Factorization (分解因式)

(b) Manipulation on the expressions with factorials (阶乘表达式的处理技巧)

2. Skills of solving problems with exponents (分析指数问题的技巧)
3. Skills of solving equations (求解方程的技巧)
4. Skills of solving inequalities (解不等式的技巧)
5. Number bases (进制数)
6. Skills of analyzing arithmetic sequences (等差数列的分析技巧)
7. Skills of analyzing geometric sequences (等比数列的分析技巧)
8. Skills of using the recursive equations method to analyze general sequences (递归方程方法分析数列的技巧)
9. Functions (函数)

Module 2: Geometry (第二模块：几何)

1. Triangles, quadrilaterals, polygons (三角形，四边形，多边形)
2. Circles (圆)
3. Analytic geometry (解析几何)
4. Solid geometry (立体几何)

Module 3: Counting and probability (第三模块：排列组合和概率)

1. Basic combinatorics (排列组合基础)

(a) Rule of sum (加法原理，分类讨论)

(b) Principle of inclusion-exclusion (容斥原理)

(c) Rule of product (乘法原理，分步计数)

(d) Permutations (排列计数)

(e) Combinations (组合计数)

2. Advanced topics in combination (组合高阶问题)

(a) Resource allocation model (资源分配模型)

(b) Binomial theorem (二项式定理)

3. Basic probability models (概率基本模型)

(a) Classical probability models (古典概率模型)

(b) Geometric models of uniform distribution (均匀分布的几何概率模型)

4. Advanced topics in probability (概率高阶问题)

(a) Skills to analyze conditional probability problems (分析条件概率的技巧)

(b) Skills of using the law of total probability (利用全概率公式解题的技巧)

5. Counting and probability problems with symmetry (含有对称性的排列组合和概率问题)

6. Recursive equations method in counting and probability (递归方程方法在排列组合和概率问题中的应用)

Module 4: Number theory (第四模块：数论)

1. Properties of primes, composites (质数和合数的性质)

2. Skills of prime factorization (分解质因数的技巧)

3. Skills of analyzing problems with greatest common divisors and least common multiples (分析含有最大公约数和最小公倍数问题的技巧)

4. Statistics of divisors (因数统计问题)

(a) Skills of analyzing problems about counting the number of divisors (统计因数个数的解题技巧)

(b) Skills of analyzing problems about the sum of divisors (统计因数之和的解题技巧)

5. Skills of analyzing problems with divisibility (解决整除问题的技巧)

6. Modular arithmetic (同余运算)

7. Skills of solving Diophantine equations (求解丢番图方程的技巧)

Module 5: Advanced topics (第五模块：高阶内容)

1. Skills of solving logarithmic problems (解决对数问题的技巧)
2. Trigonometry (三角函数)
3. Complex numbers (复数)
4. Polynomial functions (多项式)