

# Chicago Detective Explorers: ACT Math Cheat Sheet

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Your Ultimate Guide to Mastering the ACT Math Section

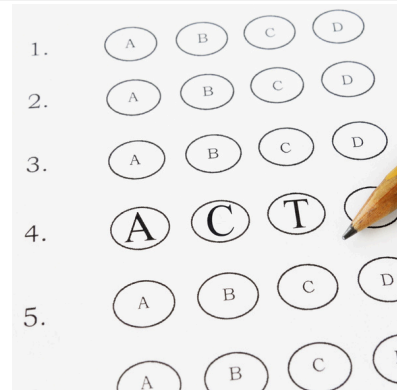


# Understanding the ACT Math Section

The ACT Math section is designed to test problem-solving skills, mathematical reasoning, and the ability to apply math concepts in real-world situations. With 60 questions in 60 minutes, efficiency and accuracy are key to success.

## ACT Math Breakdown

- ✓ Number of Questions: 60
- ✓ Time Limit: 60 minutes
- ✓ Question Types: Multiple-choice (four-option format)
- ✓ Calculator Usage: Allowed but limited to ACT-approved models
- ✓ Scoring Range: 1-36



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# Core Topics Covered on the ACT Math Section

## Pre-Algebra & Elementary Algebra

- ✓ Number Properties: Prime numbers, LCM, GCF, divisibility rules
- ✓ Fractions, Decimals, Percentages: Conversions and applications
- ✓ Ratios & Proportions: Solving direct and inverse proportions
- ✓ Basic Statistics: Mean, median, mode, probability concepts
- ✓ Linear Equations & Inequalities: Graphing and solving one-variable equations
- ✓ Word Problems: Translating real-world problems into equations
- ✓ Absolute Value & Integer Operations: Handling negatives and distance concepts



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# Core Topics Covered on the ACT Math Section

## Intermediate Algebra & Functions

- ✓ Quadratic Equations: Factoring, completing the square, quadratic formula
- ✓ Polynomials: Addition, subtraction, multiplication, special factorizations
- ✓ Exponential & Logarithmic Functions: Growth, decay, and logarithmic transformations
- ✓ Systems of Equations: Solving using substitution, elimination, and graphing
- ✓ Complex Numbers: Imaginary numbers, operations with  $i$
- ✓ Function Notation & Interpretation: Evaluating, manipulating, and graphing functions
- ✓ Matrices & Determinants: Basic matrix operations and determinants



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# Core Topics Covered on the ACT Math Section

## Geometry Mastery

- ✓ Plane Geometry: Lines, angles, triangles, quadrilaterals, polygons
- ✓ Coordinate Geometry: Midpoint, distance, slope-intercept form
- ✓ Triangle Theorems: Pythagorean theorem, special right triangles, trigonometry ratios
- ✓ Circles: Arcs, chords, inscribed angles, sectors
- ✓ Area & Volume: Perimeter, surface area, volume of 2D and 3D shapes
- ✓ Transformations & Symmetry: Reflections, rotations, translations
- ✓ Trigonometric Ratios: Sine, cosine, tangent applications



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# Core Topics Covered on the ACT Math Section

## Advanced Problem-Solving Strategies

- ✓ **Multi-Step Problems:**  
Breaking down complex problems into simpler steps
- ✓ **Data Analysis & Interpretation:** Extracting data from tables, graphs, and charts
- ✓ **Graph Analysis:** Slope, intercepts, trends, transformations
- ✓ **Pattern Recognition:** Identifying sequences, number patterns, logical connections
- ✓ **Logic & Reasoning:** Applying deduction techniques for difficult questions
- ✓ **Time-Saving Shortcuts:** Estimation, mental math tricks, quick calculations
- ✓ **Strategic Calculator Usage:** When and how to use a calculator effectively



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# ACT Math Strategies for Success

## 1. The 3-Pass Method

- 1 First Pass: Answer all easy questions first (takes less than 30 seconds).
- 2 Second Pass: Work on moderate questions that require some thought.
- 3 Third Pass: Attempt the hardest or most time-consuming problems.

## TIME MANAGEMENT BENCHMARKS

- 🕒 First 20 minutes: Answer at least 20 questions
- 🕒 Next 20 minutes: Complete another 20 questions
- 🕒 Final 20 minutes: Answer remaining questions, review marked ones

## Guessing Strategy (No Penalty for Wrong Answers!)

- ✅ Eliminate obviously wrong answers
- ✅ If stuck, pick your favorite letter (A, B, C, or D) and stay consistent
- ✅ NEVER leave a question blank

## Calculator Guidelines & Smart Usage

- ✅ ACT-Approved Calculators: TI-84, TI-30X, Casio fx-9750GII, etc.
- ✅ Avoid using a calculator for:
  - Simple arithmetic
  - Estimations and percentage calculations
  - Finding common multiples and factors
  - ✅ Best Calculator Features for the ACT:
    - Store & Recall: Save key values for multi-step problems
    - Parentheses & Order of Operations: Avoid calculation errors
    - Graphing Functions: Useful for function interpretation



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# Mental Math Techniques to Improve Speed

## 🧠 Multiplication Tricks:

- Multiply by 5 → Multiply by 10, then divide by 2
- Multiply by 25 → Divide by 4, then multiply by 100

## 🧠 Quick Percentages:

- 10% of a number → Move the decimal one place left
- 25% of a number → Divide by 4
- 75% of a number → Find 25%, then multiply by 3

## 🧠 Square Numbers Fast:

- Squaring numbers ending in 5 → Multiply first digit by itself +1, then add 25
- Example:  $35^2 = (3 \times 4)25 = 1225$





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# Test-Day Success Tips

Review key formulas and strategies

## ✓ Day Before the Test



Get 7-8 hours of sleep



Organize test materials (admission ticket, ID, calculator, pencils)

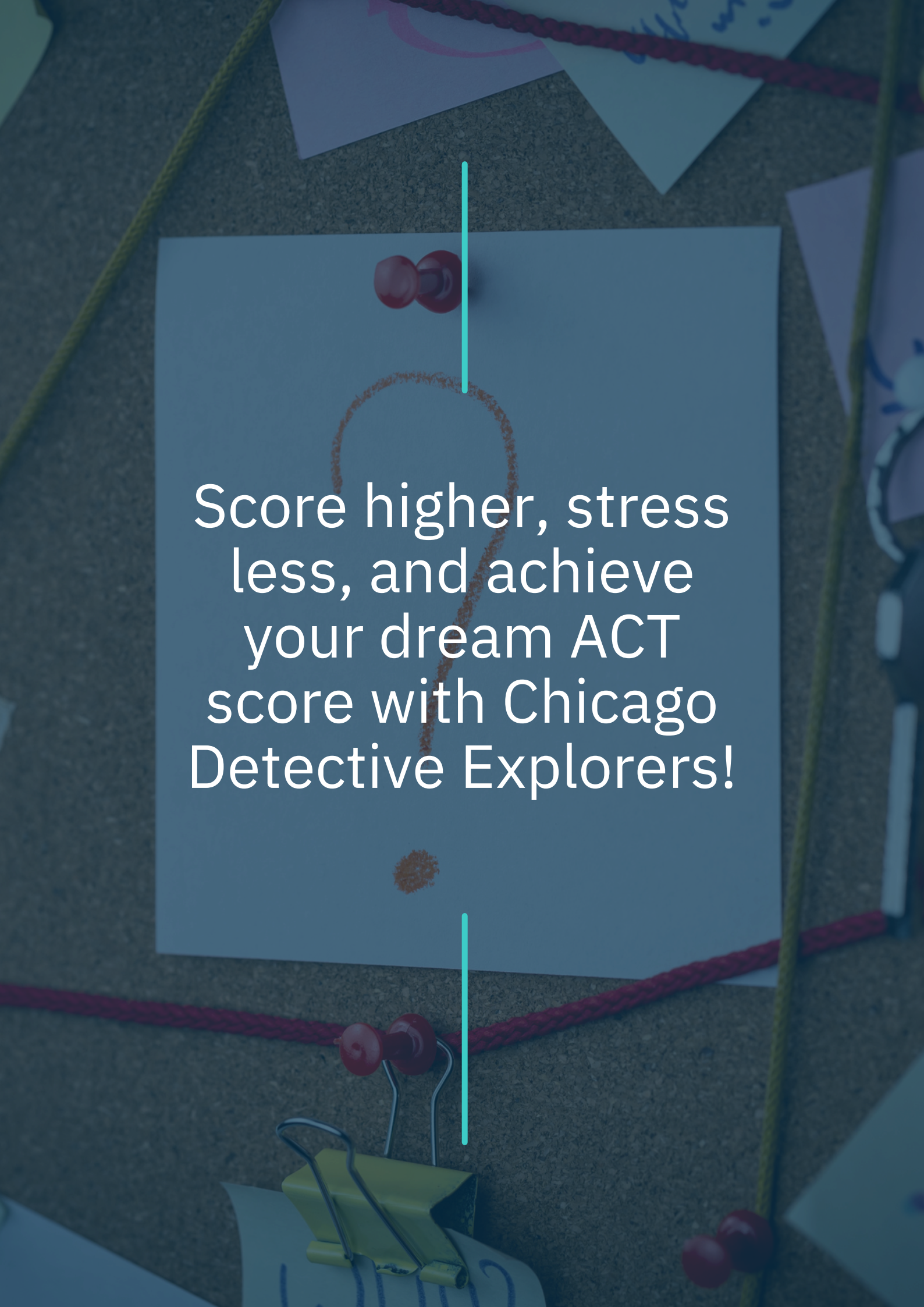
## ✓ Morning of the Test

- ✓ Eat a healthy breakfast (protein + slow-digesting carbs)
- ✓ Arrive at least 30 minutes early
- ✓ Bring an approved calculator with extra batteries

## ✓ During the Test

- ✓ Read questions carefully to avoid careless mistakes
- ✓ Use the 3-Pass Method to maximize points
- ✓ Mark difficult questions and return to them later
- ✓ Manage stress with deep breaths and a positive mindset





Score higher, stress  
less, and achieve  
your dream ACT  
score with Chicago  
Detective Explorers!