



A.C.K. Academy

SHSAT Mathematics Checklist

This is a checklist guide for preparing for the SHSAT.

Start at Level 1 and don't move on until you feel confident with those foundational skills, as everything else will build upon them.

This checklist is a fantastic tool, covering the most common topics you're likely to see. However, remember that the SHSAT can sometimes include concepts not listed here, so it's important to stay curious and open to learning other related topics if they come up as you practice problems.

Good luck! 🚀

Study Tips

Practice, Practice, Practice: The more practice problems you do, the more comfortable you'll be with the question formats and the faster you'll be able to solve them.

Time Management: The SHSAT is a timed test, so practice doing problems under time pressure.

Review Your Mistakes: When you get a problem wrong, don't just move on. Take the time to understand why you got it wrong and what you need to do to get it right next time.

"The only way to learn mathematics is to do mathematics."

- Paul Halmos



Level 1: Foundational Skills

Arithmetic Foundations

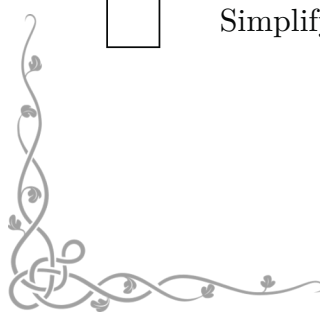
- ☐ Order of Operations (PEMDAS): Solve complex calculations with multiple operations, including exponents and negative numbers
- ☐ Properties of Integers: Factors, multiples, and prime factorization, word problems using Greatest Common Factor (GCF) and Least Common Multiple (LCM)
- ☐ Operations with Decimals: Multiply and divide decimals in a multi-step problem
- ☐ Operations with Fractions: Add, subtract, multiply, and divide fractions and mixed numbers, with unlike denominators
- ☐ Comparing Values: Compare the values of different fractions and decimals to find the largest or smallest

Basic Geometry

- ☐ Area & Perimeter: Area and perimeter of basic shapes like squares and rectangles
- ☐ Pythagorean Theorem: The pythagorean theorem to find the missing side of a right triangle
- ☐ Volume & Surface Area: Calculate the volume and surface area of a cube or rectangular prism

Basic Data & Algebra

- ☐ Mean, Median, Mode: Find the mean, median, and mode from a simple list of numbers or a frequency table
- ☐ Data Interpretation: Read a simple bar graph or line graph and answer a question about it
- ☐ Simplifying Expressions: Combine like terms to simplify an algebraic expression



Level 2: Building Competency (Multi-Step Problems)

Applied Arithmetic

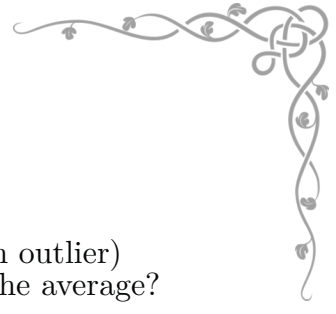
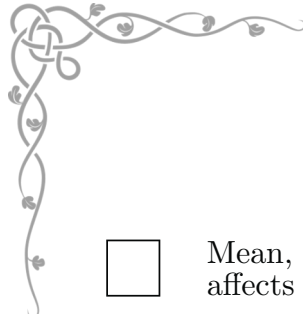
- ☐ Percentages (Multi-Step): Solve problems involving a discount followed by sales tax
- ☐ Percentages (Increase/Decrease): Calculate the final value after a percentage increase or decrease
- ☐ Percentages (Finding the Original): Given the final price and the percent discount find the original price
- ☐ Percentages (from Data): Read a chart (like a pie chart) and calculate a percentage of the total
- ☐ Ratios & Proportions: Solve problems involving scaling a recipe or a map distance
- ☐ Unit Rates: Solve "rate" problems (e.g., distance/time, cost/item)

Algebra

- ☐ Solving Linear Equations: Solve multi-step equations, including those with variables on both sides or requiring the distributive property
- ☐ Translating Words to Equations: Turn a word problem (like an "age" or "consecutive integer" problem) into an equation and solve it
- ☐ Solving Linear Inequalities: A multi-step inequality (Reminder: flip the sign when multiplying/dividing by a negative)
- ☐ Absolute Value: Solve a simple equation that involves absolute value

Geometry

- ☐ Area & Perimeter (Word Problems): Area of a rectangle given its perimeter and a relationship between its length and width
- ☐ Circles: Find the area of a circle from its circumference (and vice versa)
- ☐ Angle Relationships: Rules for angles with parallel lines and transversals (Reminder: angles in a triangle add up to 180 degrees)
- ☐ Coordinate Geometry (Basics): The slope and midpoint between two points on a coordinate plane



Data & Probability

- ☐ Mean, Median, Mode (Conceptual): Understand how adding a new number (an outlier) affects the mean and median? Can I find a missing value in a set if I'm given the average?
- ☐ Mean/Average: Find a missing value in a set if given the average
- ☐ Basic Probability: Calculate the probability of a simple event (e.g., drawing a specific marble from a bag)

Level 3: Advanced Concepts

Applied Arithmetic

- ☐ Advanced Rates (Combined Work): Solve problems where two people or machines work together at different rates
- ☐ Systems of Linear Equations: Set up and solve a word problem using two variables and two equations
- ☐ Area of Complex Shapes: Find the area of a shaded region, a trapezoid, or a composite shape made of multiple rectangles and triangles
- ☐ Pythagorean Theorem (in disguise): Distance formula on a coordinate plane or how to apply the theorem in a real-world scenario (e.g., a ladder against a wall)
- ☐ Probability of Compound Events: Calculate the probability of two independent events both occurring (e.g., flipping a coin and it landing on heads twice in a row)
- ☐ Exponents: Simplify expressions that have exponents

