

Introduction

The SAT Math section tests a wide range of mathematical concepts, including algebra, geometry, and trigonometry. This formula sheet provides essential formulas and concepts that students must know to excel in the exam. Use this sheet as a quick reference while practicing problems and taking practice tests.

How to Use this Formula Sheet

- Familiarize yourself with each section and understand how formulas are applied.
- Practice solving problems using these formulas to reinforce understanding.
- Use this as a last-minute revision guide before the exam.
- Highlight key areas that require more focus based on your practice test performance.

1. Linear Equations & Inequalities

- Slope-Intercept Form: $y = mx + b$
- Point-Slope Form: $y_2 - y_1 = m(x_2 - x_1)$
- Standard Form: $Ax + By = C$
- Inequality Rules: When multiplying/dividing by a negative, flip the inequality sign.

2. Absolute Value

- $|x| = a$ means $x = \pm a$
- $|x - c| < r$ means $-r < x - c < r$

3. Graphing Linear Equations

- Slope (m) = $(y_2 - y_1) / (x_2 - x_1)$
- Parallel lines have the same slope
- Perpendicular lines have negative reciprocal slopes

4. Systems of Equations

- Substitution Method, Elimination Method, Graphing

5. Ratios, Rates & Proportions

- Ratio: a to b means a/b
- Rate: Distance = Speed \times Time

6. Percents & Unit Conversions

- Percent Increase/Decrease = $(\text{Change} / \text{Original}) \times 100\%$

7. Table Data & Probability

- Probability = Favourable Outcomes / Total Outcomes
- Mean = Sum of values / Number of values

8. Scatterplots

- Positive correlation: Upward trend
- Negative correlation: Downward trend

9. Statistics & Data Inferences

- Median: Middle value in an ordered set
- Mode: Most frequent number

10. Functions

- $f(x)$ = output for a given x
- Composite functions: $(f \circ g)(x) = f(g(x))$

11. Exponents & Rational Exponents

- $x^a * x^b = x^{(a+b)}$
- $(x^a)^b = x^{(a*b)}$
- $x^{-a} = 1 / x^a$

12. Quadratic Equations

- Standard Form: $ax^2 + bx + c = 0$
- Quadratic Formula: $x = (-b \pm \sqrt{b^2 - 4ac}) / (2a)$

13. Angles & Triangles

- Sum of interior angles of a triangle = 180°
- Pythagorean Theorem: $a^2 + b^2 = c^2$

14. Circles & Arc Length

- Circumference: $C = 2\pi r$
- Area: $A = \pi r^2$

15. Congruence & Similarity

- Corresponding angles are equal; sides are proportional

16. Trigonometry

- SOHCAHTOA (sine, cosine, tangent)
- $\sin^2\theta + \cos^2\theta = 1$

17. Right Triangles

- Special Triangles: 30-60-90, 45-45-90

18. Volume & Surface Area

- Volume of Cylinder: $V = \pi r^2 h$
- Surface Area of Sphere: $SA = 4\pi r^2$

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