

The Ultimate Math Formula Cheat Sheet

Presented by Leveraged Learning

Mastering math isn't about memorizing every number—it's about knowing the rules of the game. Use this quick-reference guide to keep the most critical formulas at your fingertips during homework and test prep.

1. Essential Algebra

The Quadratic Formula

For any quadratic equation in the form $ax^2 + bx + c = 0$, the solutions for x are:

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Laws of Exponents

- **Multiplication:** $a^m \cdot a^n = a^{m+n}$
- **Division:** $\frac{a^m}{a^n} = a^{m-n}$
- **Power of a Power:** $(a^m)^n = a^{mn}$
- **Negative Exponent:** $a^{-n} = \frac{1}{a^n}$

Properties of Logarithms

- **Product Rule:** $\log_b(xy) = \log_b(x) + \log_b(y)$
- **Quotient Rule:** $\log_b\left(\frac{x}{y}\right) = \log_b(x) - \log_b(y)$
- **Power Rule:** $\log_b(x^c) = c \log_b(x)$
- **Change of Base:** $\log_b(x) = \frac{\log_c(x)}{\log_c(b)}$

2. Geometry & Coordinate Math

Distance & Midpoint Formulas

For any two points (x_1, y_1) and (x_2, y_2) :

- **Distance:**

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

- **Midpoint:**

$$M = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

Lines and Slopes

- **Slope (m):** $m = \frac{y_2 - y_1}{x_2 - x_1}$
- **Slope-Intercept Form:** $y = mx + b$
- **Point-Slope Form:** $y - y_1 = m(x - x_1)$

Crucial Area & Volume Formulas

- **Area of a Circle:** $A = \pi r^2$
- **Circumference of a Circle:** $C = 2\pi r$
- **Volume of a Cylinder:** $V = \pi r^2 h$

3. Trigonometry Fundamentals

Right Triangle Ratios (SOH CAH TOA)

For a right triangle with an angle θ :

- **Sine:** $\sin(\theta) = \frac{\text{Opposite}}{\text{Hypotenuse}}$
- **Cosine:** $\cos(\theta) = \frac{\text{Adjacent}}{\text{Hypotenuse}}$
- **Tangent:** $\tan(\theta) = \frac{\text{Opposite}}{\text{Adjacent}}$

The Pythagorean Theorem & Identity

- **Standard Theorem:**

$$a^2 + b^2 = c^2$$

- **Fundamental Trig Identity:**

$$\sin^2(\theta) + \cos^2(\theta) = 1$$

Ready to take your understanding to the next level?

Formulas are just the beginning.

If you struggle to apply these concepts or want to maximize your SAT/GRE score, Leveraged Learning is here to help. We offer expert, one-on-one tutoring available virtually, at our Seekonk office, or at your local library. Call us at (508) 332-6298 or scan our QR code below to schedule a free 30-minute consultation today.

