PSAT/NMSQT Math Formula Sheet

Essential formulas for the PSAT/NMSQT math sections. Organized by test domain for efficient studying.

Heart of Algebra

Slope-intercept: $y = mx + b$

Point-slope: $y - y1 = m(x - x1)$

Slope: $m = (y2 - y1) / (x2 - x1)$

Standard form: $Ax + By = C$

Systems (one): Different slopes → one solution

Systems (none): Same slope, diff intercept → no solution

Systems (inf): Same line → infinite solutions

Inequalities: Flip sign when mult/div by negative

Passport to Advanced Math

Quadratic std: $ax^2 + bx + c = 0$

Quadratic formula: $x = (-b \pm (b^2 - 4ac)) / 2a$

Vertex form: $y = a(x - h)^2 + k$, vertex at (h, k)

Factored form: $y = a(x - r1)(x - r2)$

Discriminant: $b^2 - 4ac$ (>0: two, =0: one, <0: none)

Diff of squares: $a^2 - b^2 = (a + b)(a - b)$

Exponent product: $x^a * x^b = x^{(a+b)}$

Exponent power: $(x^a)^b = x^{ab}$

Negative exp: $x^{(-a)} = 1/x^a$

Radicals: $(ab) = a * b$, $(a/b) = a / b$

Problem Solving & Data

Ratio: a : b, or a/b

Proportion: a/b = c/d, cross multiply: ad = bc

Percentage: Part = (Percent / 100) * Whole

% change: (New - Original) / Original * 100

Mean: Sum / Count

Median: Middle value (ordered)

Probability: P = Favorable / Total outcomes

Unit conversion: Multiply by conversion factor

Additional Topics

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

30-60-90: x : x3 : 2x

45-45-90: x : x : x2

Circle: $A = \pi r^2$, $C = 2\pi r$

Triangle: A = (1/2) * base * height

Rectangle: A = lw, P = 2l + 2w

Volume box: V = lwh

Volume cyl: $V = \pi r^2 h$

sin: Opposite / Hypotenuse (SOH)

cos: Adjacent / Hypotenuse (CAH)

tan: Opposite / Adjacent (TOA)

The PSAT gives you a reference sheet with some formulas, but knowing them by heart saves time. Focus on algebra and quadratics first.