GMAT Math Formula Sheet

Quantitative reasoning formulas for arithmetic, algebra, geometry, and word problems. No calculator allowed!

Arithmetic Essentials

Order of ops: PEMDAS (Parentheses, Exp, Mult/Div, Add/Sub)
Fractions add: a/b + c/d = (ad + bc) / bd
Fractions mult: a/b * c/d = ac / bd
Fractions div: a/b / c/d = a/b * d/c
Decimal → %: Multiply by 100
% of number: Part = (Percent / 100) * Whole
% change: (New - Original) / Original * 100

Number Properties

Divisibility 2: Last digit is even
Divisibility 3: Sum of digits divisible by 3
Divisibility 5: Ends in 0 or 5
Divisibility 6: Divisible by both 2 and 3
Divisibility 9: Sum of digits divisible by 9
GCF: Greatest Common Factor
LCM: LCM = (a * b) / GCF(a, b)
Evens/Odds: Even + Odd = Odd, Even * Odd = Even

Geometry

Triangle area: A = (1/2) * base * height
Triangle angles: Sum = 180 degrees
Pythagorean: $a^2 + b^2 = c^2$
Common triples: 3-4-5, 5-12-13, 8-15-17
30-60-90: x : x3 : 2x
45-45-90: x : x : x2
Rectangle: A = lw, P = 2l + 2w
Circle: $A = \pi r^2$, $C = 2\pi r$
Arc length: $(\theta/360) * 2\pi r$
Sector area: $(\theta/360) * \pi r^2$

3D Shapes

Rectangular box: V = lwh, SA = 2(lw + lh + wh)
Cylinder: $V = \pi r^2 h$, $SA = 2\pi r^2 + 2\pi rh$
Sphere: $V = (4/3)\pi r^3$, $SA = 4\pi r^2$
Cone: $V = (1/3)\pi r^2 h$

Algebra

Linear: y = mx + b, slope m = rise/run
Quadratic: $ax^2 + bx + c = 0$
Quadratic formula: $x = (-b \pm (b^2 - 4ac)) / 2a$
Diff of squares: $a^2 - b^2 = (a + b)(a - b)$
Perfect square: $(a + b)^2 = a^2 + 2ab + b^2$
Inequalities: Flip sign when mult/div by negative
Absolute value: $|x| = a$ means x = a or x = -a

Exponents & Roots

Product: $a^m * a^n = a^{(m+n)}$
Quotient: $a^m / a^n = a^{(m-n)}$
Power: $(a^m)^n = a^{mn}$
Zero exp: $a^0 = 1$ (a `0)
Negative: $a^{(-n)} = 1/a^n$
Square root: (a*b) = a * b
Cube root: cbrt(a*b) = cbrt(a) * cbrt(b)

Coordinate Geometry

Distance: $d = ((x2-x1)^2 + (y2-y1)^2)$
Midpoint: ((x1+x2)/2, (y1+y2)/2)
Slope: m = (y2 - y1) / (x2 - x1)
Parallel: Same slope (m1 = m2)
Perpendicular: m1 * m2 = -1
Circle eq: $(x - h)^2 + (y - k)^2 = r^2$

Word Problem Formulas

Rate: Distance = Rate * Time
Average speed: Total distance / Total time
Work: 1/t1 + 1/t2 = 1/t (combined)
Mixture: C1*V1 + C2*V2 = C_mix * V_total
Profit: Profit = Revenue - Cost
Simple interest: I = P * r * t
Compound: $A = P(1 + r/n)^{nt}$
Permutations: nPr = n! / (n - r)!
Combinations: nCr = n! / (r!(n - r)!)

No calculator on GMAT Quant! Practice mental math and estimation. Know your common fractions, squares, and cubes by heart.