

SAT Math Formula Sheet: Digital SAT 2026–27

satformulalab · updated 2026-09-18 · verified against College Board official materials

The official reference sheet GIVEN ON TEST DAY

Exactly what Bluebook shows you during the Math sections: **10 formulas + 2 triangles + 3 facts, all geometry**. There is not a single algebra formula on it.

CIRCLE AREA

$$A = \pi r^2$$

CIRCLE CIRCUMFERENCE

$$C = 2\pi r$$

RECTANGLE AREA

$$A = lw$$

TRIANGLE AREA

$$A = \frac{1}{2}bh$$

PYTHAGOREAN THEOREM

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

RECTANGULAR PRISM VOLUME

$$V = lwh$$

CYLINDER VOLUME

$$V = \pi r^2 h$$

SPHERE VOLUME

$$V = \frac{4}{3}\pi r^3$$

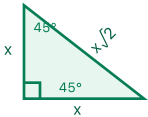
CONE VOLUME

$$V = \frac{1}{3}\pi r^2 h$$

PYRAMID VOLUME

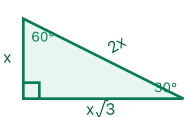
$$V = \frac{1}{3}lwh$$

45-45-90 TRIANGLE



$$x : x : x\sqrt{2}$$

30-60-90 TRIANGLE



$$x : x\sqrt{3} : 2x$$

- The number of degrees of arc in a circle is 360.
- The number of radians of arc in a circle is 2π .
- The sum of the measures in degrees of the angles of a triangle is 180.

Source: College Board digital SAT reference information (SAT Weekend Student Guide 2026–27 & official practice tests).

Formulas to memorize

Slope formula

MEMORIZE CORE

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

Two points on a line, or rows of a table of values. Nearly every linear-function question starts here.

Slope-intercept form

MEMORIZE

$$y = mx + b$$

Reading slope (m) and y-intercept (b) from an equation or a graph: the most-used line form

Point-slope form

MEMORIZE CORE

$$y - y_1 = m(x - x_1)$$

You know one point and the slope and need the equation of the line.

Parallel lines

MEMORIZE

$$m_1 = m_2$$

"Which line is parallel to...": parallel lines have equal slopes.

Perpendicular lines

MEMORIZE CORE

$$m_1 \cdot m_2 = -1$$

"Perpendicular" questions: slopes are negative reciprocals (flip and change sign).

Distance formula

MEMORIZE

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

Distance between two coordinate points (it's the Pythagorean theorem in disguise).

Midpoint formula

MEMORIZE CORE

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

Midpoint of a segment; also works backwards (given midpoint and one endpoint, find the other).

Quadratic formula

MEMORIZE

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

Solving $ax^2 + bx + c = 0$ when factoring isn't obvious. NOT on the official sheet: most-tested formula.

⚡ See the Desmos shortcut →

Vertex x-coordinate

MEMORIZE CORE

$$x = \frac{-b}{2a}$$

Max/min value or vertex of $y = ax^2 + bx + c$ without completing the square.

⚡ See the Desmos shortcut →

Vertex form

MEMORIZE

$$y = a(x - h)^2 + k$$

Reads the vertex (h, k) directly; also how answer choices often disguise quadratics.

Discriminant

MEMORIZE CORE

$$b^2 - 4ac$$

"How many real solutions?": positive → two, zero → one, negative → none.

Sum & product of roots

MEMORIZE

$$x_1 + x_2 = -\frac{b}{a}, \quad x_1 x_2 = \frac{c}{a}$$

Root questions without solving: "the sum of the solutions is...".

Exponent rules

MEMORIZE CORE

$$x^a x^b = x^{a+b}, \quad (x^a)^b = x^{ab}, \quad x^{-a} = \frac{1}{x^a}, \quad x^0 = 1$$

Simplifying expressions: exponent laws appear constantly in Advanced Math.

Equation of a circle

MEI

$$(x - h)^2 + (y - k)^2 = r^2$$

Center (h, k) and radius r in the coordinate plane. Easy to get wrong: NOT on the official sheet.

Exponential growth & decay

MEMORIZE CORE

$$y = a(1 \pm r)^t$$

Percent increase/decrease repeated over time (populations, value, interest). + for growth, - for decay.

⚡ See the Desmos shortcut →

Mean (average)

MEI

$$\bar{x} = \frac{\sum x}{n}, \quad \text{Total} = \bar{x} \cdot n$$

Averages, plus the Total = Average × Number version for "what score do I need on the 5th test to average 80?"

Weighted average

MEMORIZE CORE

$$\bar{x} = \frac{\sum w_i x_i}{\sum w_i}$$

Mixing groups with different averages (70% tests + 30% homework, mixed solutions, combined rates).

Median, mode, range

MEI

median = middle (sorted), mode = most frequent, range =

"Which value of x makes the median...": sort first, always. Range needs no formula beyond n - max + 1.

Standard deviation (concept)

MEMORIZE CORE

greater spread $\Rightarrow$ greater σ

The SAT never asks you to compute it: only which data set is more spread out. Adding a constant changes nothing; an outlier increases spread.

Percent change

MEI

$$\% \Delta = \frac{\text{new} - \text{old}}{\text{old}} \times 100$$

Percent increase/decrease: always divide by the ORIGINAL value.

Probability

MEMORIZE CORE

$$P = \frac{\text{desired outcomes}}{\text{total outcomes}}$$

Marbles, dice, "at random": desired over total, no replacement means the denominator shrinks.

SOHCAHTOA

MEI

$$\sin \theta = \frac{\text{opp}}{\text{hyp}}, \quad \cos \theta = \frac{\text{adj}}{\text{hyp}}, \quad \tan \theta = \frac{\text{opp}}{\text{adj}}$$

Right-triangle trig: one of only two trig facts you need (the other is the cofunction identity below).

Cofunction identity

MEMORIZE CORE

$$\sin x = \cos(90^\circ - x)$$

"sin 20° = cos of what?": angles that sum to 90° pair sine with cosine. Also: sin x = cos y when x + y = 90°.

Degrees $\leftrightarrow$ radians

MEI

$$180^\circ = \pi \text{ radians}$$

Converting angle units; the sheet tells you a circle is 360° = 2π, but converting is on you.

Arc length**MEMORIZE** **CORE**

$$L = \frac{\theta}{360^\circ} \cdot 2\pi r$$

Partial-circle perimeter questions: the sheet gives $2\pi r$, you supply the fraction.

Sector area**MEMORIZE**

$$A = \frac{\theta}{360^\circ} \cdot \pi r^2$$

"Area of the shaded region" inside a circle: same fraction trick with πr^2 .

Polygon interior angles**MEMORIZE** **CORE**

$$S = (n - 2) \times 180^\circ$$

Sum of interior angles of an n-gon; regular polygon single angle = S/n .

Standard form shortcut**MEMORIZE**

$$Ax + By = C \Rightarrow m = -\frac{A}{B}$$

Quick slope from standard form without rearranging.

FOIL / expanding**MEMORIZE** **NICE TO KNOW**

$$(a + b)(c + d) = ac + ad + bc + bd$$

Expanding products of binomials before collecting like terms.

Absolute value equations**MEMORIZE**

$$|x| = c \Rightarrow x = \pm c$$

Two cases: positive and negative. $|x| < c$ is a bounded interval.

Rational exponents ↔ radicals**MEMORIZE** **NICE TO KNOW**

$$x^{a/b} = \sqrt[b]{x^a}$$

Rewriting between root and exponent form in Advanced Math simplification.

Compound interest**MEMORIZE**

$$A = P \left(1 + \frac{r}{n}\right)^{nt}$$

Low frequency on the SAT: usually the yearly version $y = a(1+r)^t$ is enough.

Distance–rate–time**MEMORIZE** **NICE TO KNOW**

$$d = rt$$

Motion and unit-rate word problems; watch unit conversions.

Permutations & combinations**MEMORIZE**

$${}_nP_k = \frac{n!}{(n-k)!}, \quad {}_nC_k = \frac{n!}{k!(n-k)!}$$

Rare, but appears in hard counting problems. Order matters → P.

Parallel line angles**MEMORIZE** **NICE TO KNOW**

$$\text{corresponding} =, \quad \text{co-interior} = 180^\circ$$

Two parallel lines cut by a transversal: "big + small = 180° " when they're not equal.

Exterior angle sum**MEMORIZE**

$$360^\circ$$

Exterior angles of any polygon always sum to 360° .

Similar triangles**MEMORIZE**

NICE TO KNOW

$$\frac{a}{a'} = \frac{b}{b'} = \frac{c}{c'}$$

Nested/shadow triangles: corresponding sides are proportional.

Direct & inverse variation**MEMORIZE**

$$y = kx, \quad y = \frac{k}{x}$$

"y varies directly/inversely with x": find k from one pair, then answer.

Imaginary unit**MEMORIZE**

NICE TO KNOW

$$i^2 = -1$$

Occasional complex-number arithmetic: $i^2 = -1$, $i^3 = -i$, $i^4 = 1$ (cycle of 4).

Surface area**MEMORIZE**

$$\text{sphere} = 4\pi r^2, \quad \text{cyl} = 2\pi r^2 + 2\pi rh, \quad \text{box} = 2(lw + lh +$$

"Nice to know" tier: the sheet gives volumes, not surface areas.