SAT Math Formula Sheet

Linear equations and systems

Slope-intercept	$y = mx + b$
Point-slope	$y - y_1 = m(x - x_1)$
Example intersection	$y = 2x + 1; y = x + 4$

For the example, set the expressions equal: x = 3 and y = 7.
A solution must work in both equations.

Quadratic equations

Standard form	$ax^2 + bx + c = 0$
Discriminant	$D = b^2 - 4ac$
Quadratic formula	$x = (-b \pm \text{sqrt}(D)) / (2a)$
Axis of symmetry	$x = -b/(2a)$

a is nonzero. For real coefficients, D < 0 means no real roots. sqrt(D) means square root.

Exponential models

General form	$y = a \times b^t$
Growth	$b = 1 + r$
Decay	$b = 1 - r$
Example: 10% growth	$y = 40 \times 1.1^t$

a is the initial value, t counts equal periods, and r is a per-period rate as a decimal. Use 0 < r < 1 for decay.

Ratios and unit rates

Unit rate	rate = amount / quantity
Example	$12 ÷ 3 kg = $4 per kg
Proportional relation	$y = kx$

Name the units and keep the ratios in the same order.
k is the rate per one unit of x.

Center and spread

Mean	sum / count
Median	middle of the ordered data
Range	maximum − minimum

For an even count, the median is the mean of the two middle values.
Example: 1, 4, 7, 8 has median 5.5.

Basic probability

Equally likely outcomes	P(A) = favorable / total
Complement	P(not A) = 1 − P(A)
Example: fair die	P(even) = 3/6 = ½

The favorable count comes from the group named in the question.

Right triangle trigonometry

Sine	sin(angle) = opposite / hypotenuse
Cosine	cos(angle) = adjacent / hypotenuse
Tangent	tan(angle) = opposite / adjacent
Side lengths	$a^2 + b^2 = c^2$

Choose the acute angle before naming the legs. In the side rule, c is the hypotenuse.

Circles

Circumference	$C = 2\pi r = \pi d$
Area	$A = \pi r^2$

The radius r runs from center to edge.
Diameter d = 2r.
Circumference uses length units; area uses square units.

