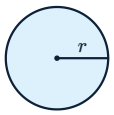
SAT Math Formula Chart

1600.now

Given in Bluebook



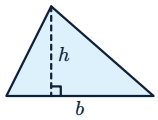
Circle

$A = \pi r^2$

$C = 2\pi r$

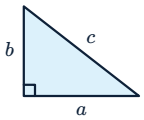
Rectangle

$A = lw$



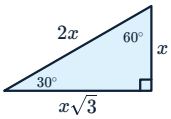
Triangle

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



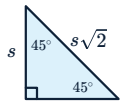
Pythagorean theorem

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



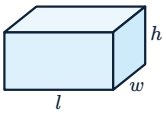
30°-60°-90° triangle

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



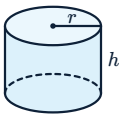
45°-45°-90° triangle

$s,\ s,\ s\sqrt{2}$



Rectangular solid

$V = lwh$

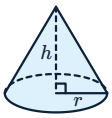


Cylinder

$V = \pi r^2 h$

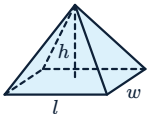
Sphere

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



Cone

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



Rectangular pyramid

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

Angles

A circle has $360°$ of arc, or 2π radians.

A triangle's angles add to $180°$.

Not given: memorize these

Lines

Slope	$m = \frac{y_2 - y_1}{x_2 - x_1}$
Slope-intercept form	$y = mx + b$
Point-slope form	$y - y_1 = m(x - x_1)$
Parallel, perpendicular	$m_1 = m_2, \quad m_1 m_2 = -1$

Quadratics

Quadratic formula	$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
Discriminant	$b^2 - 4ac$ Positive: 2 real solutions. Zero: 1. Negative: none.
Vertex form	$y = a(x - h)^2 + k$ Vertex (h, k)
Vertex x-coordinate	$x = -\frac{b}{2a}$
Sum, product of solutions	$-\frac{b}{a}, \quad \frac{c}{a}$ For $ax^2 + bx + c = 0$

Exponents and percents

Exponential growth, decay	$y = a(1 + r)^t, \quad y = a(1 - r)^t$
Percent change	$\frac{\text{new} - \text{old}}{\text{old}} \times 100\%$

Circles and coordinates

Circle equation	$(x - h)^2 + (y - k)^2 = r^2$ Center (h, k), radius r
Arc length	$\frac{\theta}{360} \cdot 2\pi r$ θ in degrees; $r\theta$ in radians
Sector area	$\frac{\theta}{360} \cdot \pi r^2$ θ in degrees; $\frac{1}{2}r^2\theta$ in radians
Distance	$\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$
Midpoint	$\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$

Trigonometry and similarity

Sine, cosine, tangent	$\sin\theta = \frac{\text{opp}}{\text{hyp}} \quad \cos\theta = \frac{\text{adj}}{\text{hyp}}$ $\tan\theta = \frac{\text{opp}}{\text{adj}}$
Complementary angles	$\sin x^\circ = \cos(90^\circ - x^\circ)$
Similar figures	Scale factor k: lengths $\times k$, areas $\times k^2$, volumes $\times k^3$

Data

Mean	$\frac{\text{sum of values}}{\text{number of values}}$
Probability	$\frac{\text{favorable outcomes}}{\text{total outcomes}}$

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