SAT/ACT Formula Sheet

Exponents and Radicals

$x^m \cdot x^n = x^{m+n}$ $\frac{x^m}{x^n} = x^{m-n}$ $(x^m)^n = x^{mn}$ $(xy)^n = x^n y^n$ $\left(\frac{x}{y}\right)^n = \frac{x^n}{y^n}$

$x^{-n} = \frac{1}{x^n}$ $\sqrt[n]{x} = x^{\frac{1}{n}}$ $\sqrt[n]{xy} = \sqrt[n]{x} \cdot \sqrt[n]{y}$ $\sqrt[n]{\frac{x}{y}} = \frac{\sqrt[n]{x}}{\sqrt[n]{y}}$ $\sqrt[n]{x^m} = x^{\frac{m}{n}}$

Logarithms

$\log_a a^x = x$ $x\log_a y = \log_a y^x$ $\log_a x + \log_a y = \log_a (xy)$ $\log_a x - \log_a y = \log_a (\frac{x}{y})$ $\log_a x = b \Leftrightarrow a^b = x$

Miscellaneous

Percents $\% = \frac{part}{whole} \cdot 100$

Arithmetic Mean= $\frac{sum\ of\ terms}{quantity\ of\ terms}$

Percent Change: $\frac{New - Old}{Old} \cdot 100$

$Speed = \frac{distance}{time}$

Linear Equations

$Slope(m) = \frac{Rise}{Run} = \frac{y_2 - y_1}{x_2 - x_1}$

$Point - Slope\ Form: y - y_1 = m(x - x_1)$

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

$Slope - Intercept\ Form: y = mx + b$

$m = slope$

$b = y - intercept$

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

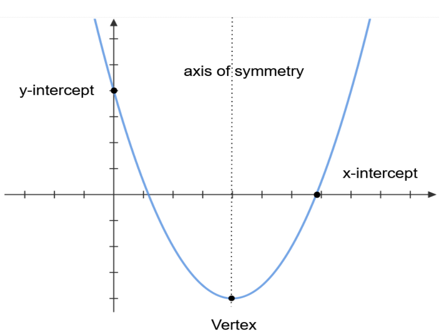
Quadratic Equations

$Standard\ Form: f(x) = ax^2 + bx + c$

$Factored\ Form: f(x) = a(x - r)(x - s)$

$Vertex\ Form: a(x - h)^2 + k$

$vertex: (h, k)$



$Axis\ of\ Symmetry: x = -\frac{b}{2a}$

$Vertex: \left(-\frac{b}{2a}, f\left(-\frac{b}{2a}\right)\right)$

$Quadratic\ Formula:$

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

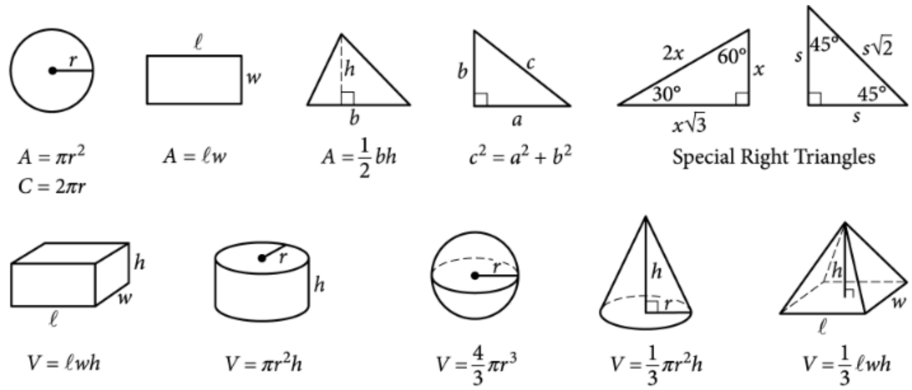
$Discriminant: b^2 - 4ac$

$If\ b^2 - 4ac > 0,\ 2\ real\ solutions$

$If\ b^2 - 4ac = 0,\ 1\ real\ solution$

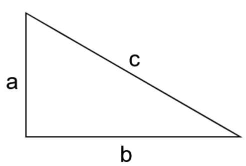
$If\ b^2 - 4ac < 0,\ 2\ complex\ solutions$

SAT Given Formulas

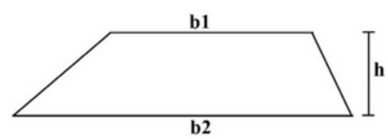


The number of degrees of arc in a circle is 360.
The number of radians of arc in a circle is 2π.
The sum of the measures in degrees of the angles of a triangle is 180.

Additional Shape Geometry



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



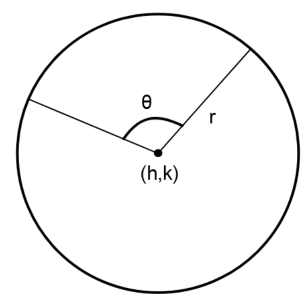
Area of a Trapezoid:
$A = \frac{1}{2}(b_1 + b_2)h$

Triangle Inequality Theorem:
The sum of any 2 side lengths of a triangle is greater than the length of the third side.

General Equation of a Circle:
$(x - h)^2 + (y - k)^2 = r^2$

Area of a Sector of a Circle:
$A = \frac{\theta}{360°} \cdot \pi r^2$

Arc Length of a Circle:
$L = \frac{\theta}{360°} \cdot 2\pi r$



Angles and Lines

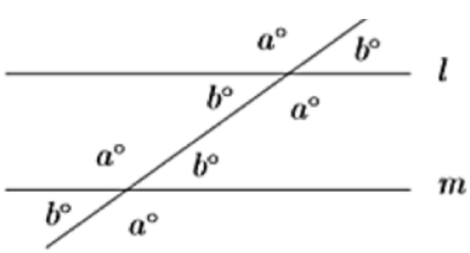
Sum of Interior Angles = $180(n - 2)°$

Each Interior Angle = $\frac{180(n-2)°}{n}$

Sum of Exterior Angles=360°

Each Exterior Angle=$\frac{360°}{n}$

*where n= number of sides in the polygon



Given two parallel lines and a third straight line that crosses both of them(called a transversal), the angles marked on the diagram show which angles are equal in degree measure.

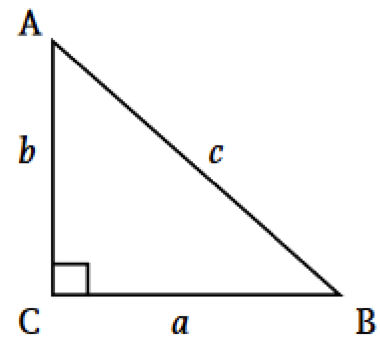
∠a+∠b=180°

Trigonometry

SOH $\sin A = \frac{\text{opposite leg}}{\text{hypotenuse}}$ $\csc A = \frac{\text{hypotenuse}}{\text{opposite leg}}$

CAH $\cos A = \frac{\text{adjacent leg}}{\text{hypotenuse}}$ $\sec A = \frac{\text{hypotenuse}}{\text{adjacent leg}}$

TOA $\tan A = \frac{\text{opposite leg}}{\text{adjacent leg}}$ $\cot A = \frac{\text{adjacent leg}}{\text{opposite leg}}$



$$sinA = cos(90 - A)$$

$$cosA = sin(90 - A)$$