



Algebra 1 Formula List

Exponent Rules

$$a^m \times a^n = a^{m+n}$$

$$a^m \div a^n = a^{m-n}$$

$$(a^m)^n = a^{mn}$$

$$a^{-m} = \frac{1}{a^m}$$

$$a^0 = 1$$

Sequences

The Nth term of the arithmetic sequence $a_1, a_2, \dots, a_{n-1}, a_n$ is given by $a_1 + (n - 1)d$, where d is the common difference.

The Nth term of the geometric sequence $a, ar, ar^2 \dots ar^{n-1}$ is given by ar^{n-1} , where r is the common ratio.

Straight Lines

The equation of a straight line is $y = mx + c$, where m is the gradient and c is the y -intercept.

An alternative form is $y - b = m(x - a)$ where m is the gradient and (a, b) is any point on the line.

The gradient of a straight line, m , through two points (x_1, y_1) and (x_2, y_2) is $m = \frac{y_2 - y_1}{x_2 - x_1}$

Functions

The average rate of change of the function f over the interval (a, b) is given by

$$\frac{f(b) - f(a)}{b - a}$$



Quadratic Formula

The roots of the quadratic equation $ax^2 + bx + c = 0$ are given by

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

The discriminant is defined as $b^2 - 4ac$ and the nature of the roots are

2 real roots where $b^2 - 4ac > 0$

1 real root where $b^2 - 4ac = 0$

0 real roots where $b^2 - 4ac < 0$