Completing the square

$f(x) = a(x + b)^2 + c$

$f(x) = 2x^2 + 4x + 3$

$f(x) = 2(x + 1)^2 - 2 + 3$

$f(x) = 2(x + 1)^2 + 1$

Easy to graph functions & graphs

Factor Theorem

$x = a$ is a factor of $f(x)$ if $f(a) = 0$

-2	1	4	5	2
	1	-2	-4	-2

1 2 1 0

(x+2) is a factor since no remainder

If finding coefficients Sim. Equations

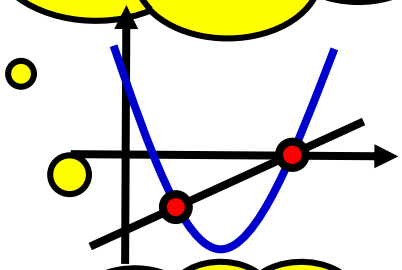
Discriminant of a quadratic is $b^2 - 4ac$

Polynomials

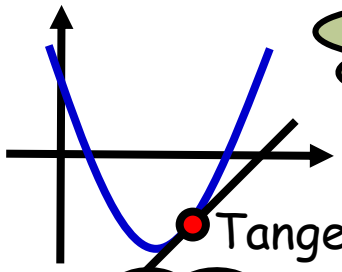
Functions of the type

$f(x) = 3x^4 + 2x^3 + 2x + x + 5$

Degree of a polynomial = highest power



$b^2 - 4ac > 0$ Real and distinct roots



Tangency

$b^2 - 4ac = 0$ Equal roots

$b^2 - 4ac < 0$ No real roots