• Nature of Roots

$$\Delta = b^2 - 4ac$$

if $\Delta < 0$ → non-$\mathbb{R}$ roots
$\Delta = 0$ → equal roots
$\Delta > 0$ → $\mathbb{R}$ roots

if $\sqrt{\Delta}$ ⇒ perfect square → $\mathbb{Q}$
not $\sqrt{\Delta}$ = $\mathbb{Q}'$

• Exponents & Surds.

- $x^m \cdot x^n = x^{m+n}$
- $\frac{x^m}{x^n} = x^{m-n}$
- $(5x)^0 = 1$
- $(2x)^m = 2^m x^m$
- $\left(\frac{x}{y}\right)^m = \frac{x^m}{y^m}$
- $n^{-1} = \frac{1}{n^1}$
- $\sqrt[3]{x^2} = x^{\frac{2}{3}}$
- $\sqrt{12} = 2\sqrt{3}$ → simplest surd form (DO on calculator)

* Shift fact base nr's !!
(make product of primes)