POLYNOMIAL THEOREMS

The Integer Root Theorem

A monic polynomial has only integer rational roots.

Rational Root Theorem

$\frac{p}{q}$ a root $\implies$ $q \mid a_n$

MONIC: $a_n = 1$

Denominator forced

$q = \pm 1$, so $\frac{p}{q}$ is an integer

HENCE

Integer Root Theorem

Rational roots are integers dividing a_0

- $x^3 - 6x^2 + 11x - 6$: candidates $\pm 1, \pm 2, \pm 3, \pm 6$; roots $1, 2, 3$
- $x^2 - n$ is monic, so $\sqrt{n}$ is a whole number or irrational