Zeros

Rational numbers: Numbers that can be written as a fraction

Irrational numbers: Numbers with decimals that go on forever but not in a pattern

Rational Zero Theorem: Find factors of constant & put over factors of leading coefficient to find possible rational zeros $\frac{p}{q}$

Example:

$f(x) = 6x^2 + 2x - 4$

$\pm 1, \pm 4, \pm\frac{1}{2}, \pm 2, \pm\frac{4}{3}, \pm\frac{1}{3}, \pm\frac{2}{3}, \pm\frac{1}{6}$

ex: $\frac{e}{\pi}, \sqrt{2}, \sqrt{97}, e$

Upper bounds: If answer to synthetic division are all positive,then no numbers above that work

Example:

Lower bounds: If answer to synthetic division are alternating signs, then no number below that works

Descartes' Rule of Signs: Find number if sign changes in original function, that tells you how many positive real numbers you have (subtract 2 for imaginary numbers)

Example:

Find number if sign changes in function when x is negative, that tells you how many negative real numbers you have (subtract 2 for imaginary numbers)

Zeros

Rational numbers:

Irrational numbers:

Rational Zero Theorem:

Example:

Upper bounds:

Lower bounds:

Example:

Descartes' Rule of Signs:

Example:

Complex Zeros

Definition of conjugate: When binomials are same numbers or variables, but opposite operation

ex $(x+2)(x-2)$ $3-4i, 3+4i$

Difference between x-intercepts and zeros: X-intercepts are all the real zeros. Zeros include all solutions for x, even imaginary.

Complex zeros always come in ____Pairs____!

Complex Zeros

Definition of conjugate:

Difference between x-intercepts and zeros:

Complex zeros always come in _____!