Class Discussion

Unit 2 Topic 3 Part 2 The quest of zeroes 2

Objective: The Rational Zero test

Given $f(x)=a_nx^n+a_{n-1}x^{n-1}+a_{n-2}x^{n-2}+\ldots+a_3x^3+a_2x^2+a_1x+a_0$

Let p be the possible factors for a_0, and q be the possible factors for a_n, if $f(x)$ has rational zeroes,

$$x=\frac{p}{q}$$

Example 1: Find all rational zeroes for $f(x)=12x^4+8x^3-9x^2-9x-2$.

Tips to quickly narrow down/find a rational zero

1. when the sum of all coefficients equals zero ➔ $x=1$

2. when sum of all coefficients in the even-powered terms equals to the sum of all coefficients in the odd-powered terms ➔ $x=-1$

3. if all coefficients are having the same sign. ➔ $x<0$

4. if all coefficients on even-powered terms have the same sign and all coefficient on odd-power terms has the same sign but the signs of two groups are different. ➔ $x>0$

Example 2: Find all rational zeroes of $f(x)=2x^4-3x^3-5x^2+9x-9$