Section 4.4: cont'd

Friday, January 29, 2016
11:30 AM

New due date:

Assign 2 due Wed, Feb 3

But Quiz 2 still on Fri, Feb 5

Descartes' Rule of Signs:

rule: the maximum number of positive real zeros of $P(x)$ = the number of sign changes in coeffs of $P(x)$

→ then count down by twos to get the possible numbers of positive real zeros

example: 6 sign changes means a max of 6 positive real zeros

6 sign changes means either 6, or 4, or 2, or no positive real zeros

5 sign changes means either 5 or 3 or 1 positive real zeros (at least 1)

⇒ the max number of negative real zeros is = the number of sign changes in $P(-x)$

example: use Descartes' Rule to determine the number of possible positive and negative zeros the following polynomial could have

$$P(x) = 2x^7 - x^6 - x^5 + x^4 - x^3 + x + 1$$

positive zeros: count sign changes in $P(x)$

could be 4, 2, 0

negative zeros: $P(-x) = 2(-x)^7 - (-x)^6 - (-x)^5 + (-x)^4 - (-x)^3 + (-x)$

$$= -2x^7 - x^6 + x^5 + x^4 + x^3 - x + 1$$

count sign changes

could be 3 or 1