The Location Principle is a handy tool because it allows us to find where the roots of a polynomial equation are.

Location Principle (p. 210): _________________________________________
_______________________________________________________________________
_______________________________________________________________________
_______________________________________________________________________

Example: Determine between which consecutive integers the real zeros of \( f(x) = x^3 + 2x^2 - 3x - 5 \) are located.
In the problem above, we had to check all integers between -5 and 5. Wouldn’t it be nice to know if there are boundaries to where the roots could be located? It turns out that there is.

Upper Bound Theorem (p. 212): __________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________

Note: Zero coefficients are ignored when counting sign changes.

Lower Bound of the zeros of $P(x)$ can be found by determining an upper bound for the zeros of $P(-x)$. Therefore, if $c$ is an upper bound of the zeros of $P(-x)$, then $-c$ is a lower bound of the zeros of $P(x)$.

Example: Find the upper and lower bounds of the zeros of $f(x) = x^4 - 3x^3 - 2x^2 + 3x - 5$. 
