Graphing Polynomial Functions

Complete the 10-steps described in the chart for each of the following polynomial functions.
On the graph of your function, label the zeros, y-intercepts, and extrema with ordered pairs (rounded to three decimal places)

1. $f(x) = x^4 - x^3 - 7x^2 + 13x - 6$

2. $f(x) = -2x^3 - x^2 + 8x + 4$

3. $f(x) = -3x^4 + 9x^3 + 3x^2 - 9x$

4. $f(x) = 3x^4 + 7x^3 - 6x^2 - 12x + 8$

5. $f(x) = 2x^3 - 15x^2 + 4x + 21$

6. $f(x) = -2x^4 + 13x^3 - 21x^2 + 2x + 8$

Original Function how many possible zeros (n) and extrema (n - 1) {extrema aka relative min/max}	***Even*** (reflection over y; f(-x) = f(x) ***Odd*** (rotation 180° about origin; f(-x) = -f(x) ***Neither***
End behavior: ***even exponent***: leading coefficient positive 👍 👍; negative 👎 👎 ***odd exponent***: leading coefficient positive 👎 👍; negative 👍 👎	**Descarte's Rule of Signs** (how many times the sign changes from term to term) f(x): the # of positive real zeros of f is = or less by an even amount f(-x): the # of negative real zeros of f is = or less by an even amount
Rational Zero Test (p's and q's) use synthetic division—don't forget to use upper and lower bounds to help you! (if all terms have a common variable, factor it, and list it with the factors)	Factors and their multiplicity (even--touches x axis; odd--crosses through x-axis)
find the zeros	After graphing a sketch by hand, use a calculator to find Increasing/Decreasing Intervals
Extra Points including y-intercept	**After graphing by hand, graph on a calculator to find** **Relative max** (changes from inc to dec); **Relative min** (changes from dec to inc)