Algebra 2 Name:
Graphing Polynomials Date:

Multiply $2(x^2 - x + 3)(2x - 1)$. Use the distributive law (and maybe the box)! What is the degree and leading coefficient of the resulting polynomial? How **might** you have known the degree and leading coefficient **before** simplifying? Explain.

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Graphing Polynomials

Remembering Linear and Quadratic Functions:

Write the general equation of a linear polynomial and a quadratic polynomial, both in standard form.

Linear: Quadratic:

What cues in the equation of a line tell you about its shape? Whether it is increasing or decreasing?

What cues in the equation of a quadratic tell you about its shape? Whether it opens up or down?

Cubics and Quartics:
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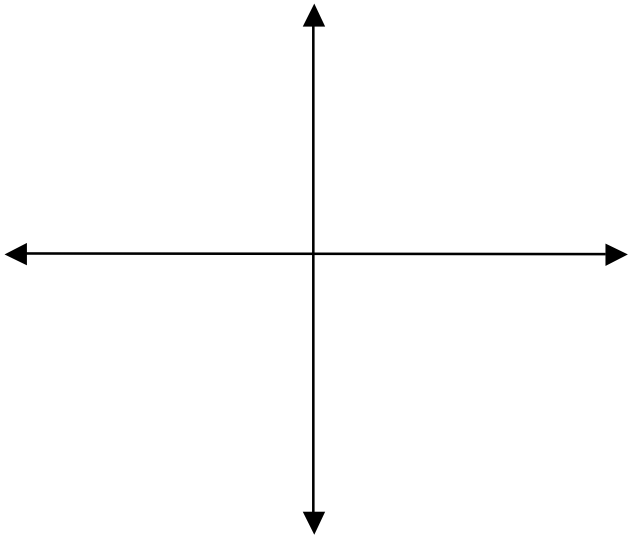
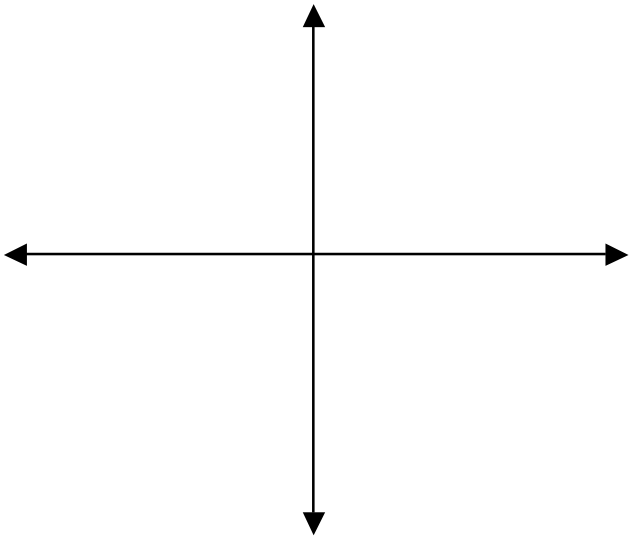
Graph the following polynomials on your graphing calculator. Sketch their graphs below.

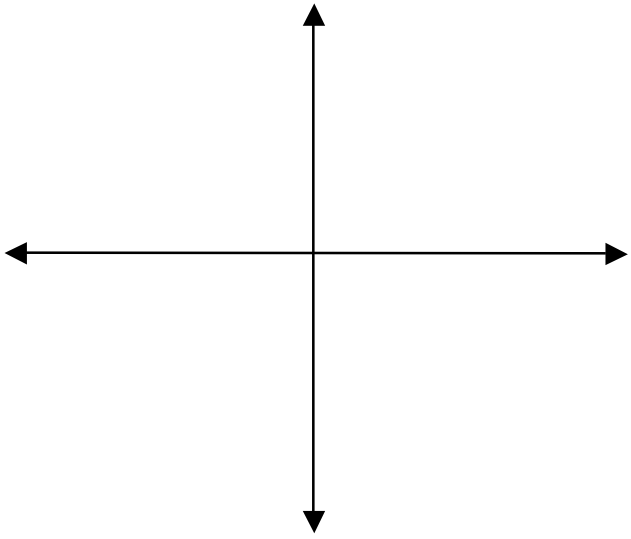
1. $f(x) = x^3 + x^2 - 4x - 1$



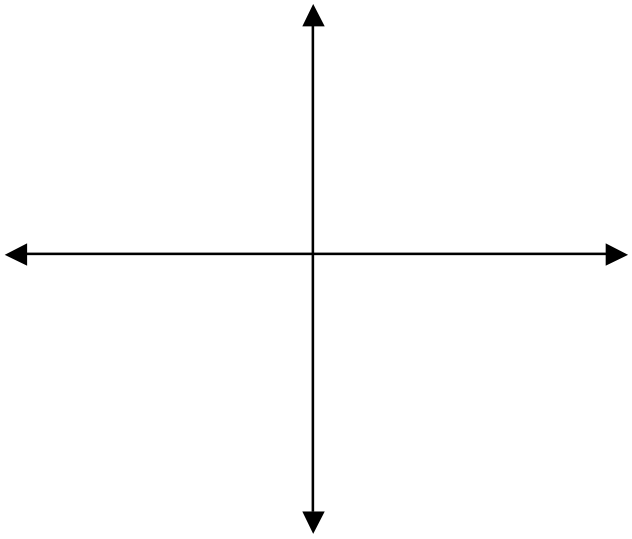
2. $f(x) = -2x^3 + x^2 + x + 2$



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

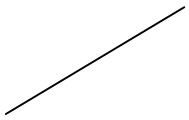
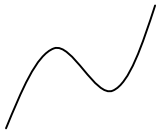


4. $f(x) = x^4 - 2x^3 + x - 1$



What do you observe about the shapes of the different graphs, their degrees and their leading coefficients?

Fill in the chart based on your observations.

Polynomial	Leading Coefficient	Behavior at the "ends"	Sketch
Linear		As x→ -∞, f(x) goes down As x → ∞, f(x) goes up	
	Negative	As x→ -∞, As x → ∞,	
Quadratic	Positive	As x→ -∞, As x → ∞,	
		As x→ -∞, f(x) goes down As x → ∞, f(x) goes down	
Cubic		As x→ -∞, As x → ∞,	
		As x→ -∞, f(x) goes up As x → ∞, f(x) goes down	
Quartic	Positive	As x→ -∞, As x → ∞,	
		As x→ -∞, f(x) goes down As x → ∞, f(x) goes down	