
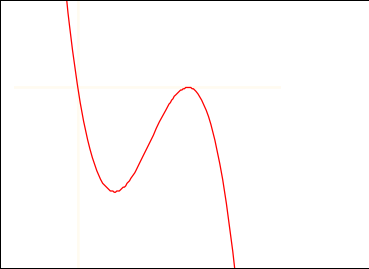
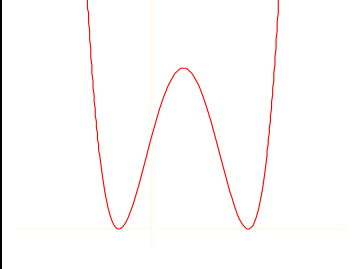
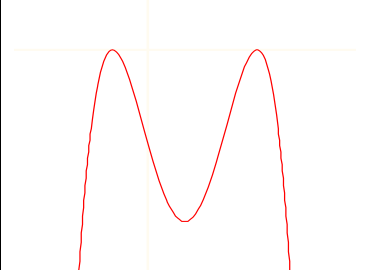


Advanced Algebra & Trigonometry  
Graphing Polynomial Functions

When we graph a polynomial function, we consider several aspects of the graph:

- **End Behavior**

The direction that the ends of the graph point depends on the degree of the polynomial and the sign of the leading coefficient.

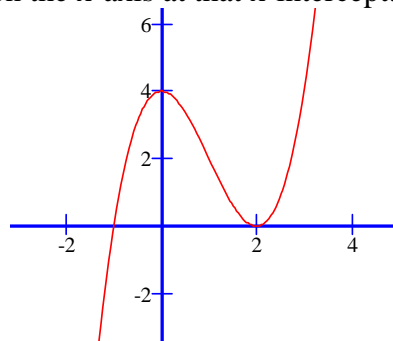
	Positive Lead Coef.	Negative Lead Coef.
Odd Degree		
Even Degree		

- **X-Intercepts**

Real roots are points where the graph crosses the x-axis.

If a root is a repeated root (it divides evenly into the polynomial more than once), it only translates into one x-intercept. If the root comes from a factor with an even degree, the graph will actually have a vertex, or turning point, on the x-axis at that x-intercept:

In this graph, the function has a double root at  $x = 2$ , notice that the graph has a vertex at  $x = 2$  on the  $x$ -axis.



Imaginary roots are not shown on the graph.

- **Y-Intercept**

A polynomial graph will only have one y-intercept. To find the y-intercept, substitute 0 for  $x$  into the function.

*Practice: Graph each of the following by finding the end behavior, x-intercepts and y-intercept.*

1.  $f(x) = 2x^3 + 5x^2 - 3x$

2.  $f(x) = -2x^3 + 9x^2 - 8x - 3$

3.  $f(x) = x^4 + 2x^3 + 2x^2 + 10x - 15$