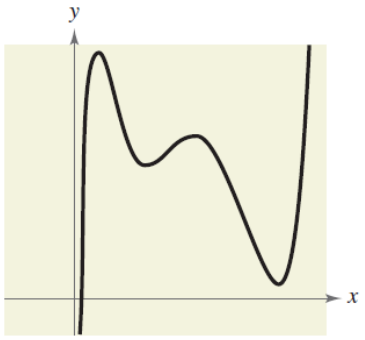
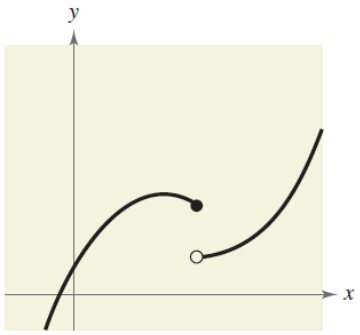
Pg. 139 2.2 – Polynomial Functions of Higher Degree

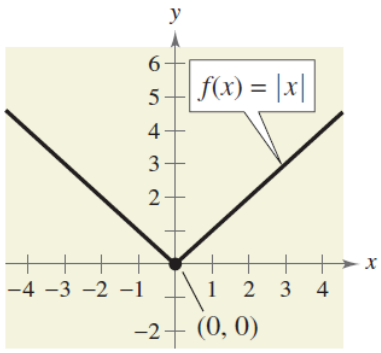
Polynomial Functions are continuous and have smooth round curves.

Example:

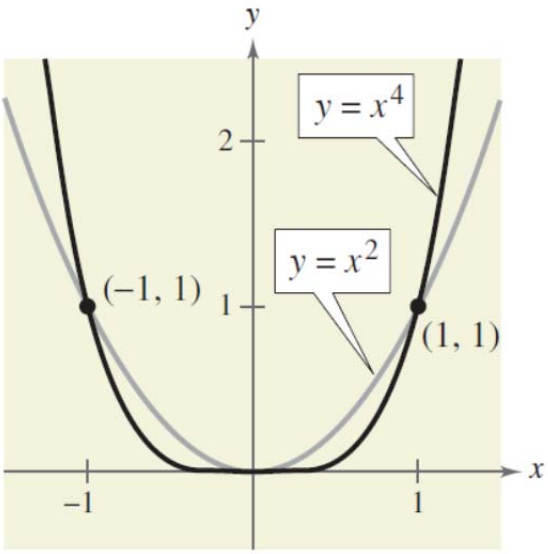


Non-Examples:

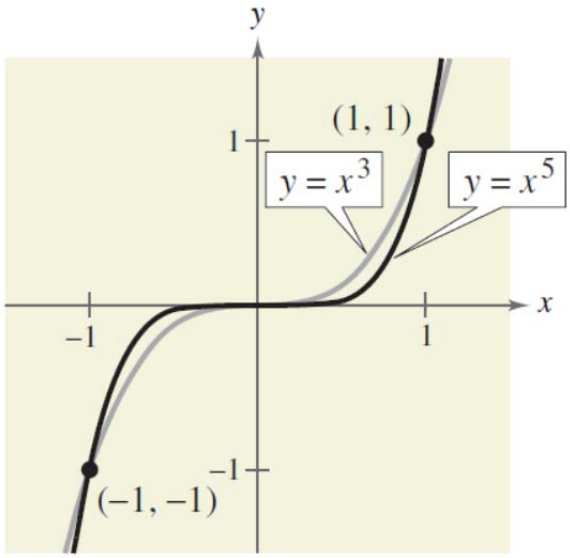




If n is even for $f(x) = x^n$, then the graph is a U-shaped.



If n is odd for $f(x) = x^n$, then the graph is a S-shaped.



How Graph Any Polynomial Function

1. Apply the Leading Coefficient Test

If positive, graph is normal. If negative, graph flips.

2. Find the Zeros of the Polynomial and Their Multiplicity

If zero has <u>even</u> repetition, then graph <u>touches</u> the x-axis.

If zero has <u>odd</u> repetition, then graph <u>crosses</u> x-axis.

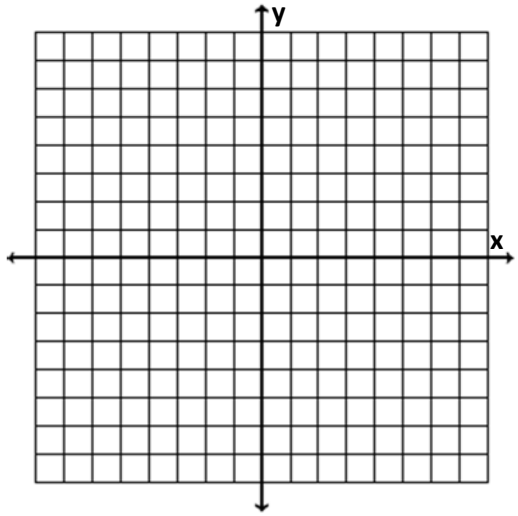
3. Plot a Few Additional Appoints for Great Accuracy

Plot points from each interval defined by zeros.

Ex 1:
Graph the polynomial function. State the zeros, multiplicity of each zero, x-intercepts, number of turning points. Describe the right –hand and left-hand behavior of the graph of the polynomial function.

Note: For a polynomial of degree n, there is at most n zeros and n -1 turning points.

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



Zeros:

Multiplicity:

x-intercepts:

# of Turning Points:

Behavior:

Ex 2:
Find a polynomial of degree n that has the given zero(s). (There are many correct answers)

Zero(s)	Degree
$x = -5, 1, 2$	$n = 4$

Note: The multiplicities of all the zeros must add up to the degree of the polynomial**.**

Ex 3: TI-Calculator Demonstration $f(x) = x^5 - 6x^3 + 9x$

Assignment 2.2

Pg. 148 Vocab #'s 1-6 ALL Problem Set #'s 1-83 ODD, 89, 91, Skip 29

<u>REQUIRED</u>: Vocab, 5, 9, 13, 33, 37, 51, 59, 63, 67, 77, 83, 89, 91