

5.4 Day 1: Analyzing Graphs of Polynomial Functions

- objectives:** Identify zeros
 Identify local max and min values
 Identify increasing and decreasing intervals

Maximum and Minimum Points: Quadratic functions have either a _____ or a _____ point.

For higher degree polynomial functions, you can find _____ which represent _____ or _____ points.

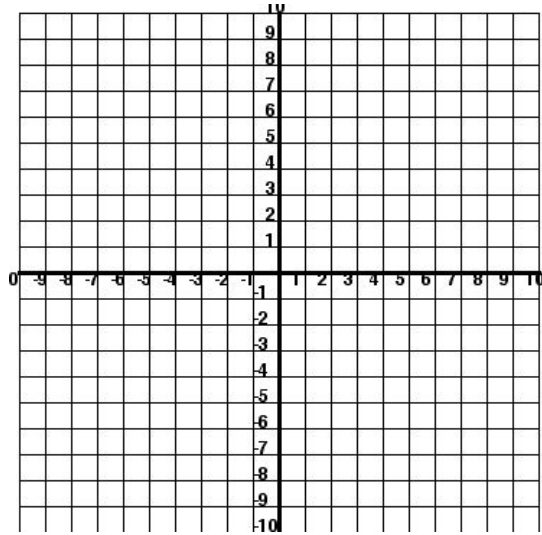
The degree of a polynomial determines: _____
 _____.

A function with degree of n has at most _____ turning points and at most _____ x intercepts.

Examples:

1. Graph $f(x) = x^3 + 3x^2 - 6x - 8$ on your calculator. Find the zeros, relative maxima & minima. Use these points to sketch the graph at the right.

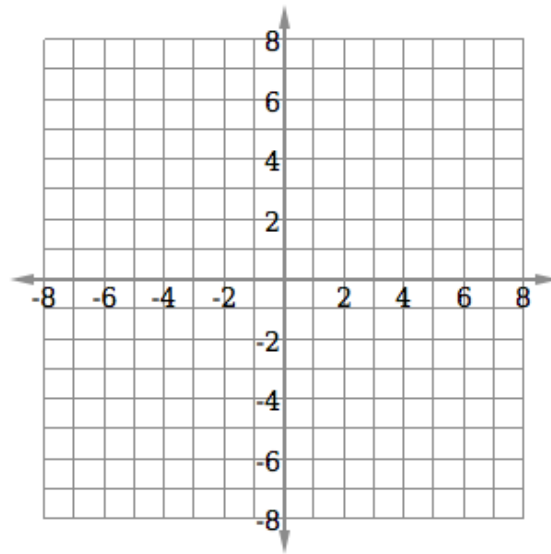
x	$f(x)$
-5	
-4	
-3	
-2	
-1	
0	
1	
2	
3	



- | | |
|--|---|
| <p>a. How many zeros?</p> <p>c. On what interval(s) of x is $f(x)$ increasing?</p> <p>c. What is the relative maximum?</p> | <p>b. How many turning points?</p> <p>d. On what interval(s) of x is $f(x)$ decreasing?</p> <p>d. What is the relative minimum?</p> |
|--|---|

2. Graph $f(x) = -x^3 - 2x^2 + 5x + 6$ on your calculator. Find the zeros, relative maxima & minima. Use these points to sketch the graph.

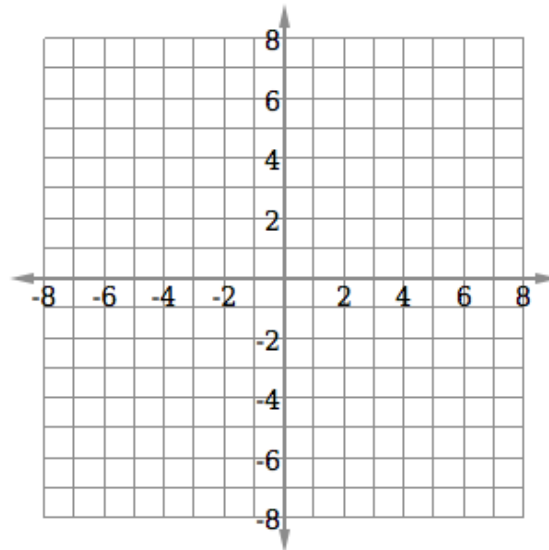
x	$f(x)$
-4	
-3	
-2	
-1	
0	
1	
2	
3	



- How many zeros?
- How many turning points?
- On what interval(s) of x is $f(x)$ decreasing?
- On what interval(s) of x is $f(x)$ increasing?
- What is the relative minimum?
- What is the relative maximum?

3. Graph $f(x) = x^4 - 4x^3 + 2x^2 + 4x - 3$ on your calculator. Find the the relative maxima and minima. Use these points to sketch the curve to the right.

x	$f(x)$
-2	
-1	
0	
1	
2	
3	
4	



- How many zeros?
- How many turning points?
- On what interval(s) of x is $f(x)$ decreasing?
- On what interval(s) of x is $f(x)$ increasing?
- What are the relative minimums?
- What is the relative maximum?