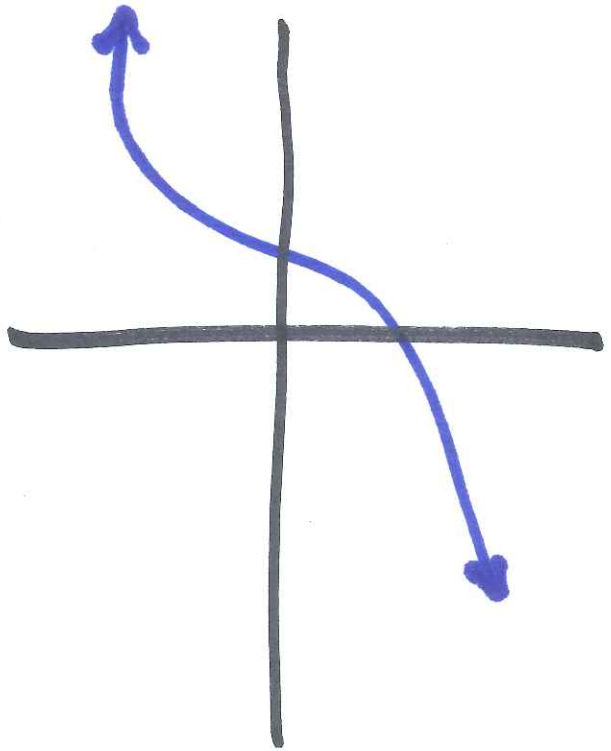
Good Morning!!

MA 110. 9/28/16.

- Exam solutions posted at exam archive. www.math.uky.edu/~ma110/exams/.

Office hours on Fri. 11-12, not 10-11.

REEF #1.



(T) $g(x) = -6x^7 - 42x + 42$ has $g(0) > 0$ and is decreasing

End behavior of polynomials.

Behavior for $|x|$ large.

- Depends on term with highest power of x.

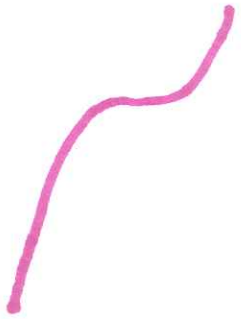
Summarize

$P(x) = ax^n + \dots$

4 cases

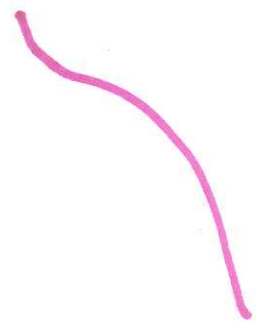
$a > 0$ n even

$a > 0$ n odd



$a < 0$ n even

$a < 0$ n odd

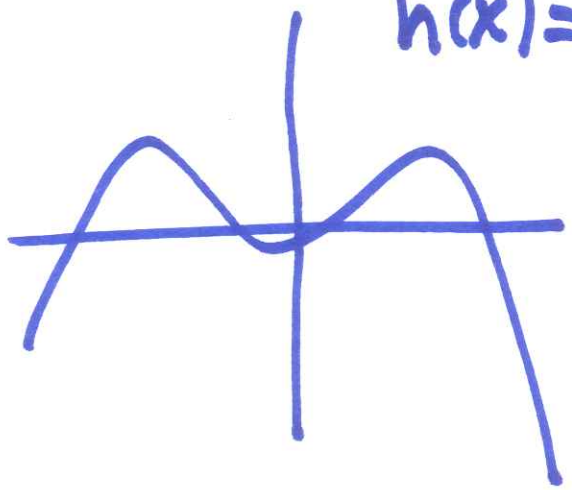


REEF #2

$h(x) = ax^n + \dots$

$a < 0$

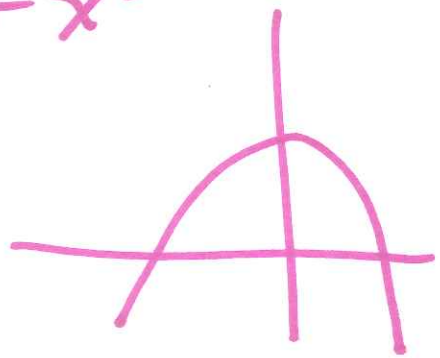
n even



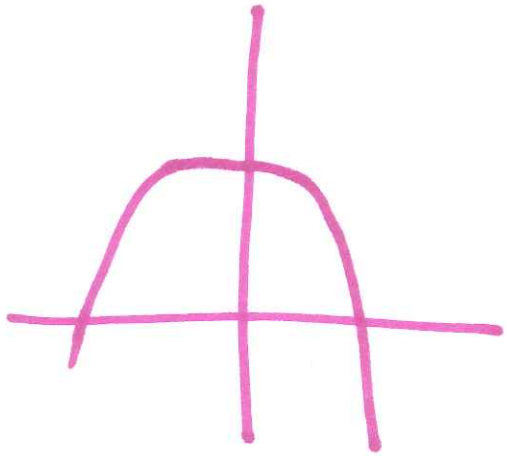
Fact: If $P(x)$ is a polynomial of degree n, the $P(x)$ has at most n roots. or solutions of $P(x)=0$.

Example

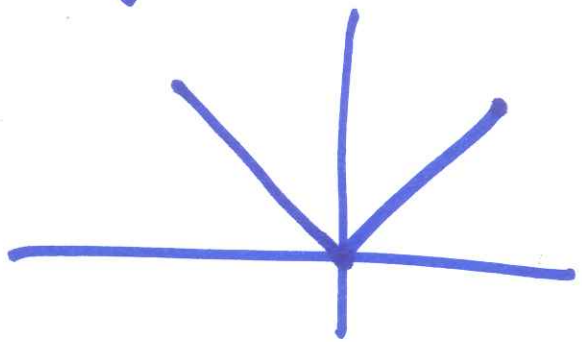
$3-x^2$



$P(x) = 3 - x^{444}$



$y = |x|$



Local maxima & minima.

- Local max is a point graph that is higher than nearby points.
- Local min is a point which is lower than nearby points.

A polynomial of degree n has at most n-1 local extrema.

(Extrema = maximum or minimum.)

Behavior near roots

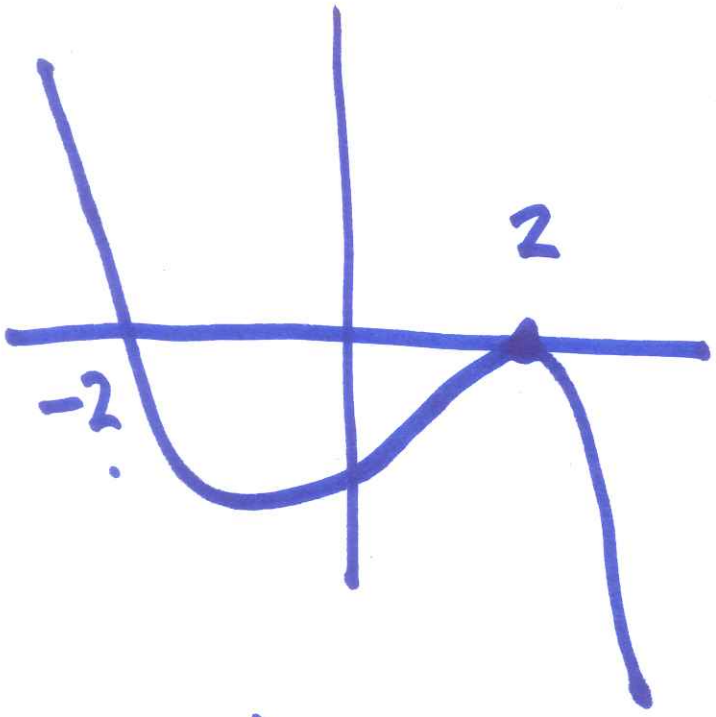
If $P(x) = (x-c)^k Q(x)$ with $Q(c) \neq 0$.

If k is odd, then P crosses the x-axis.

If k is even P touches the x-axis etc.

REEF.

$-(x+2)(x-2)^4$.



$(x-2)^k$ k even

$(x+2)^k$ k. odd.

Leading term has negative coefficient