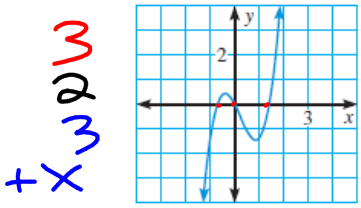
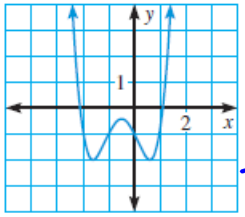
Real Zeros? Number of turning points? Least Degree?

Warm Up



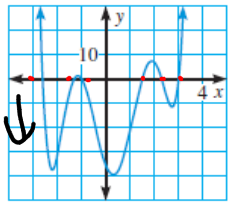
3 2 3

$+x^3$



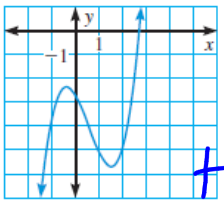
2 3

$+x^4$



6 5 6

$+x^6$



1 2 3

$+x^3$

Oct 15-9:19 AM

KEY CONCEPT *For Your Notebook*

Turning Points of Polynomial Functions

1. The graph of every polynomial function of degree n has *at most* $n - 1$ turning points.
2. If a polynomial function has n distinct real zeros, then its graph has *exactly* $n - 1$ turning points.

*Let's talk about the schedule!

Oct 15-10:22 AM

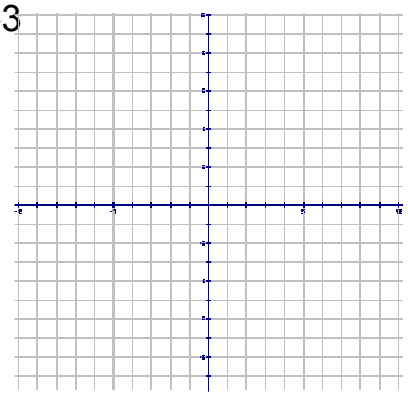
Graphing Higher Order Polynomials in **Standard Form**.

1) If you can't factor,
Plot points (-2, -1, 0, 1, 2)

2) Use general shape

3) Remember end behavior (consider extreme f(-100), f(100))

ex: $f(x)=-x^3+x^2+3x-3$



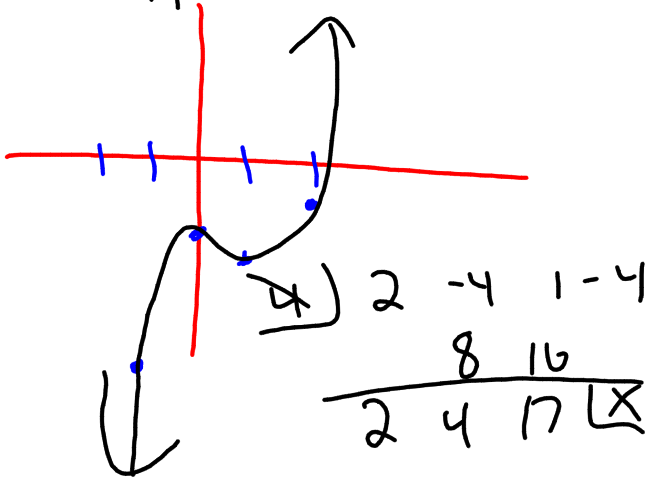
Oct 19-9:28 PM

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

x	y
-2	-38
-1	-11
0	-4
1	-5
2	-2

$\frac{4}{2}: \frac{1, 2, 4}{1, 2}$

$\pm 1, \frac{1}{2}, 2, 4$



4) 2 -4 1 -4

8 16

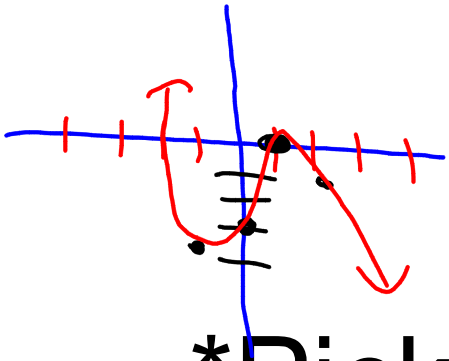
2 4 17 X

Oct 26-11:29 AM

Graph the following. Label at least 3 points, including y intercepts, and describe end behavior.

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

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



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

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

$-x^2(x-1)+3(x-1)$

$(-x^2+3)(x-1)$

$x=1$

x	y
-1	-4
0	-3
1	0
2	-1

*Pick 2!

Oct 19-9:31 PM

Graphing Higher Order Polynomials in **Intercept Form**.

1) Plot intercepts as points

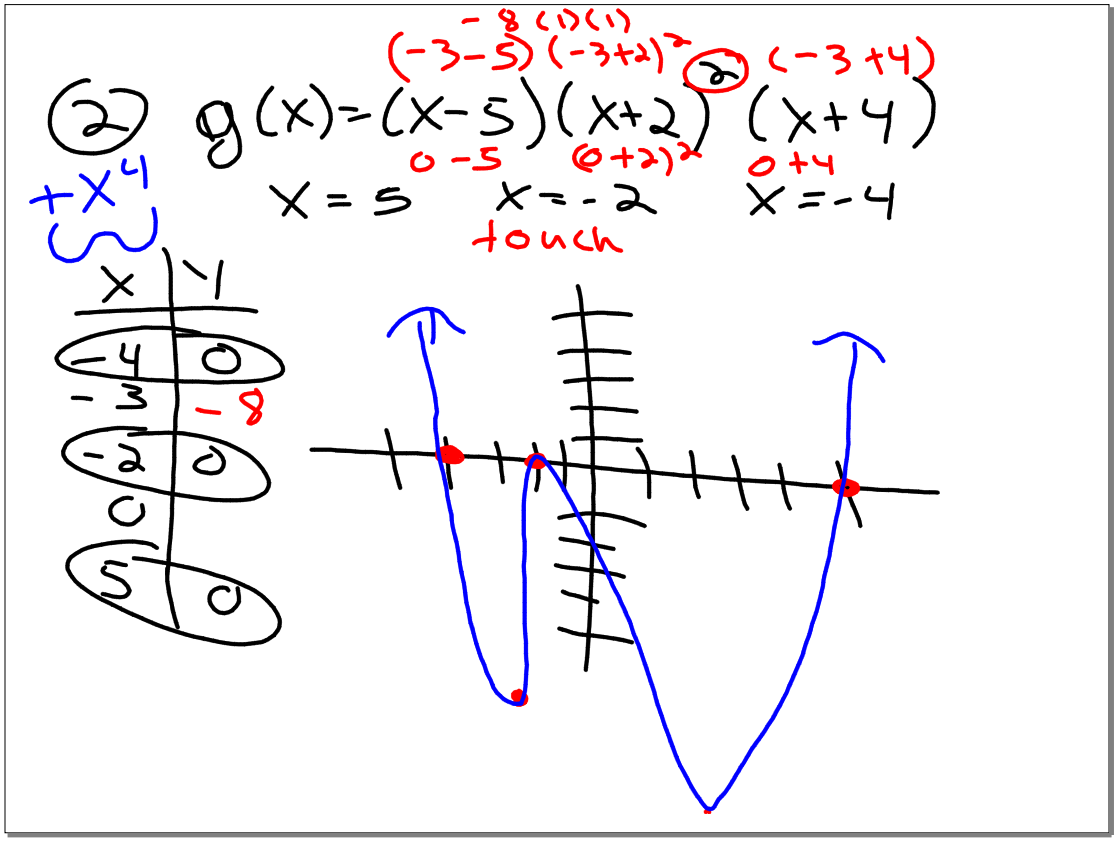
2) Plot a couple of other points in between intercepts to get general shape

3) Use general shape

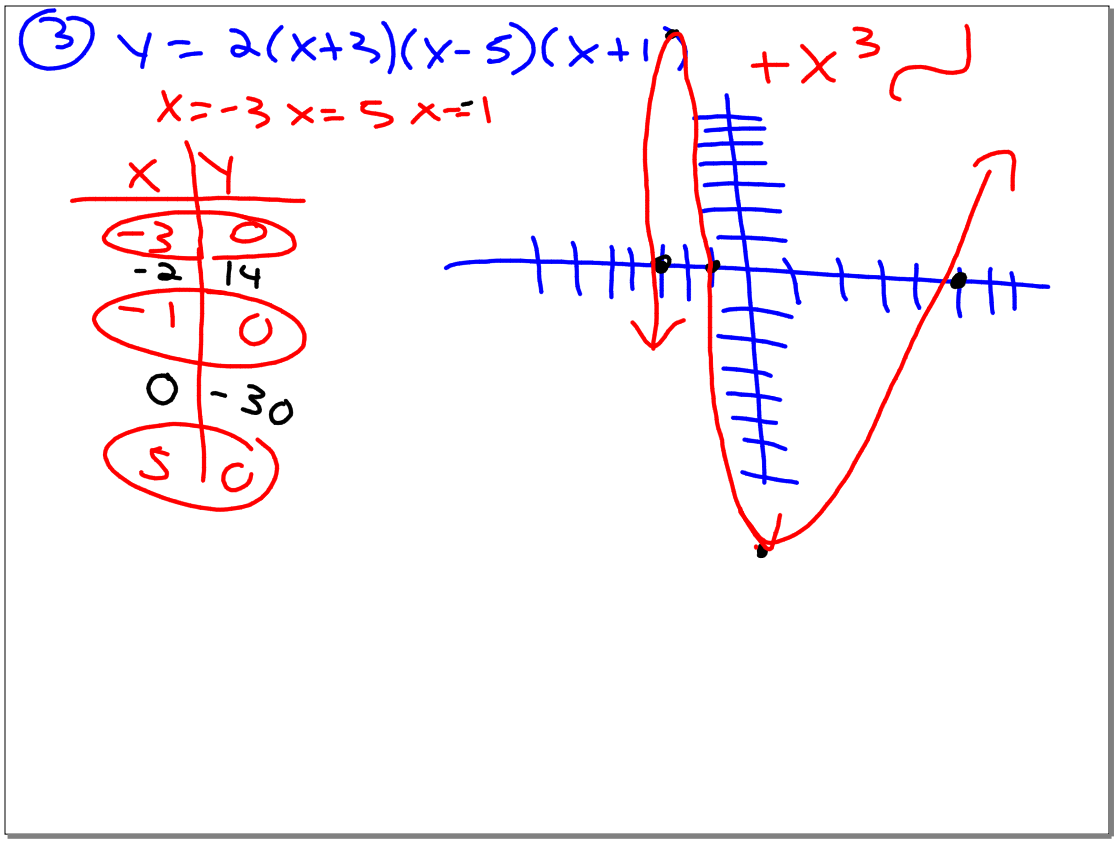
4) Remember end behavior (consider extreme f(-100), f(100))

Ex: $f(x)=1/3(x-5)(x+2)(x-3)$

Oct 19-9:34 PM



Oct 26-11:50 AM



Oct 26-11:55 AM

(4) $y = (x+2)[(x+4)(x-4)]$

$x^2 - 4x + 4x - 16$

$(x+2)(x^2-16)$

$y = x^3 - 16x + 2x^2 - 32$

$y = x^3 + 2x^2 - 16x - 32$

Oct 26-12:00 PM

(5) $y = (x+2)(x-3)^2$

$y = (x+2)(x-3)(x-3)$

$y = (x+2)(x^2 - 6x + 9)$

$y = x^3 - 6x^2 + 9x + 2x^2 - 12x + 18$

$y = x^3 - 4x^2 - 3x + 18$

Oct 26-12:03 PM

*Practice ws

*Vote????

Oct 25-9:34 AM

Using a function behavior to describe leading coefficient & degree of a polynomial.

*match a yellow graph with a green strip

*Let's Try one together!!!

*Work on Matching Cards

-yellow graph

-blue equation

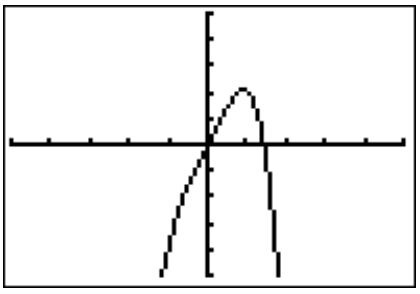
-orange equation

Oct 19-9:25 PM

Graphing Calculator

Real Zeros? Maximum(s)? Minimum(s)?

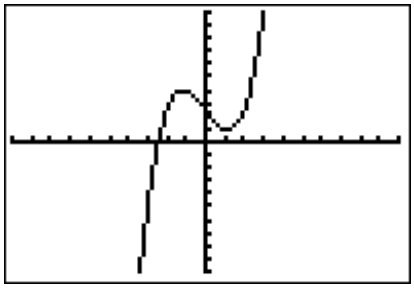
$h(x) = -x^4 + 3x$



max (.91, 2.04)

zeros (0,0) (1.44, 0)

$g(x) = 0.5x^3 - 2x + 2.5$



max (-1.15, 4.04) min (1.15, .96)

zero (-2.46, 0)

Oct 15-9:24 AM

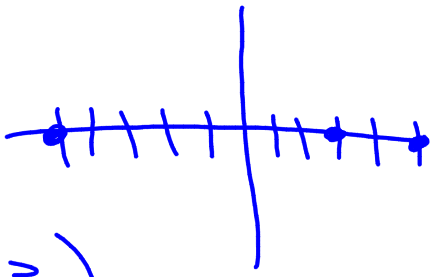
Unit 3 Day 7
Polynomial Functions
(5.3 / 5.7)The Fundamental Theorem of Algebra
and some other stuff...

Oct 18-12:49 PM

II. FTA -Given the zeros

Find the lowest degree polynomial that has the following roots.

1.) $5, -5, 3$



$y=(x-5)(x+5)(x-3)$

Oct 18-12:53 PM

II. FTA -Given the zeros

Find the lowest degree polynomial that has the following roots.

$x^2=-1$

$x^2+1=0$

$\sqrt{x^2}=\sqrt{-1}$

$x=\pm i$

3.) $1, i, -i$

$(x-1)(x-i)(x+i)$

$x^2+ix-ix-i^2$

$(x-1)(x^2+1)$

$x^3+1x-1x^2-1$

$y=x^3-1x^2+1x-1$

Oct 18-12:54 PM

II. FTA -Given the zeros

Find the lowest degree polynomial that has the following roots.

4.) $4, -2i$ $+2i$

$(x-4)(x+2i)(x-2i)$

$x^2-2ix+2ix-4i^2$ (-1)

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

$x^3+4x-4x^2-16$

$y=x^3-4x^2+4x-16$

$\sqrt{x^2}=\sqrt{-4}$

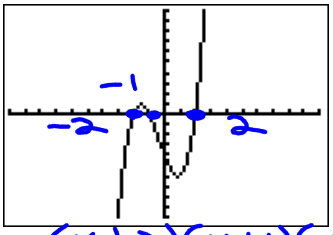
$x=\pm 2i$

Oct 18-12:54 PM

III. FTA -Given the graph

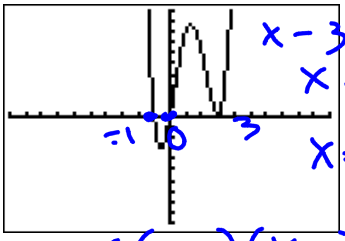
Write an equation of the polynomial.

1.)



f(x)= $(x+2)(x+1)(x-2)$

2.)



$x=-1$ $x+1$

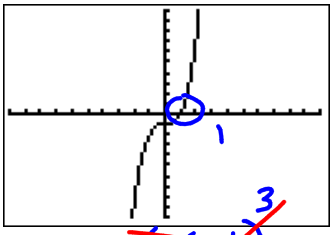
$x-3=0$

$x=3$

$x=0$

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

3.)



f(x)= $(x-1)^3$

x^3-1

Oct 15-9:33 AM

Dec 30-12:22 PM

Homer Simpson	Spongebob Squarepants	Winnie the Pooh	Big Bird	Ronald McDonald
Tweety Bird	Simba	Pikachu	Belle	Bert
Wario	Pac-Man	Wolverine	The Minions	Woodstock

Dec 30-12:17 PM

IV. Polynomial Operations

Adding and Subtracting Polynomials

1.) $(2x^3 - 4x) + (-x^3 + x^2 - 2x) =$ $x^3 + 1x^2 - 6x$

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

$x^4 - 3x^3 + 4x^2 - 2$

Oct 18-12:55 PM

IV. Polynomial Operations

Multiplying Polynomials

3.) $-2x^2(3x^4 + x - 1) =$ $-6x^6 - 2x^3 + 2x^2$

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

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

6.) $(x + 4)^3$ $(x+4)(x+4)(x+4)$

Oct 18-12:55 PM

SPACE EXPLORATION The table shows the typical speed y (in feet per second) of a space shuttle x seconds after launch. Find a polynomial model for the data. Use the model to predict the time when the shuttle's speed reaches 4400 feet per second, at which point its booster rockets detach.

x	10	20	30	40	50	60	70	80
y	202.4	463.3	748.2	979.3	1186.3	1421.3	1795.4	2283.5

Oct 18-10:33 AM

The table shows the number of vehicles y in thousands fueled by Ethanol 85 each year x from 1999 to 2004. Find a polynomial model for the data. Use the model to predict the number of vehicles that will be fueled by Ethanol 85 in 2005.

Year	Number of Vehicles
0	24.604
1	87.570
2	100.303
3	120.951
4	133.776
5	146.195

Oct 18-10:33 AM

Homework for Friday/Monday:

Page 390/ 3, 5, 7, 8 (graphing)

Page 384/ 22-24 (writing equations)

Page 349/ 22, 34, 44, 49 (algebraic operations)

Page 398/ 25-28 (finding equation from table)

Total of 15 problems

Oct 25-9:36 AM

Word Problem WS-due on Review Day

Oct 22-9:12 AM

Homework:

- CH 5 Test

  -Review worksheet due next Thursday.

Oct 7-3:19 PM