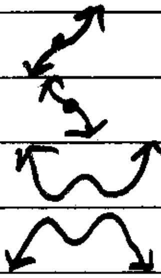
Algebra 4.1 Polynomials of Degree Greater Than 2

x^3 poly w/ a positive leading coefficient
x^3 poly w/ a negative leading coefficient
x^4 poly w/ a positive leading coefficient
x^4 poly w/ a negative leading coefficient



Ex $f(x) = 2x(x-2)(x+3)$ Test 0, 2, 3

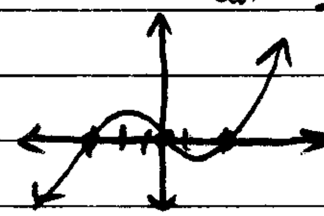
When is $f(x) > 0$ $2x(x-2)(x+3) > 0$

When is $f(x) < 0$ $2x(x-2)(x+3) < 0$

$f(x) > 0$ $(-3, 0) \cup (2, \infty)$

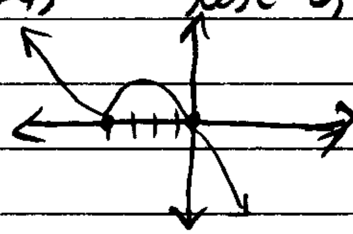
$f(x) < 0$ $(-\infty, -3) \cup (0, 2)$

		-3	0	2
$2x$	−	−	+	+
$x-2$	−	−	−	+
$x+3$	−	+	+	+
all	−	+	−	+



Ex $f(x) = -3x(x+4)^2$ test 0, −4

		-4	0
$-3x$	+	+	−
$(x+4)^2$	+	+	+
all	+	+	−



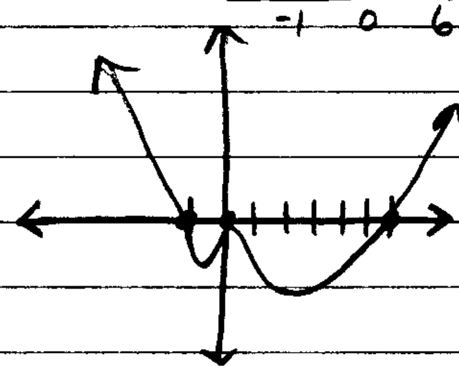
Ex $f(x) = x^4 - 5x^3 - 6x^2$

$x^2(x^2 - 5x - 6)$

$x^2(x-6)(x+1)$

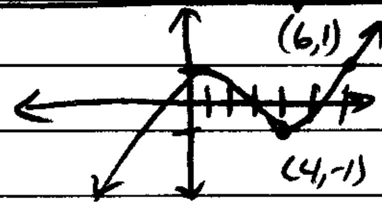
zeroes 0, 6, −1

		-1	0	6
x^2	+	+	+	+
$x-6$	−	−	−	+
$x+1$	−	+	+	+
all	+	−	−	+



Alg 4.1

Intermeadiate Value Theorem



somewhere between 4 and 6, y must equal zero

Ex Does $f(x)=x^5+4x^4-2x^3+3x-7$ have a zero between 1 & 2?

Plug 1 and 2 for x and see what happens

$f(1)=(1)^5+4(1)^4-2(1)^3+3(1)-7$

$=1+4-2+3-7=-1$ (1,-1)

$f(2)=(2)^5+4(2)^4-2(2)^3+3(2)-7$

$=32+64-16+6-7=79$ (2,79) yes

If $f(x)=x^3-5x^2-9x+15K$ has 5 for a zero, find 2 other zeros

$0=(5)^3-5(5)^2-9(5)+15K$

$0=125-125-45+15K$

$K=3$

$f(x)=x^3-5x^2-9x+45$

$x^2(x-5)-9(x-5)$

$(x^2-9)(x-5)$

$(x+3)(x-3)(x-5)$ the other two zeros are 3 and -3

EX $f(x)=x^3-5x^2$

$x^2(x-5)$

x^2	+	+	+
x-5	−	−	+
all	−	−	+
		0	5