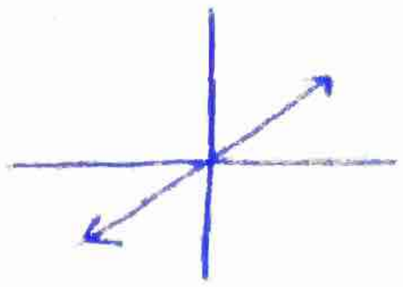
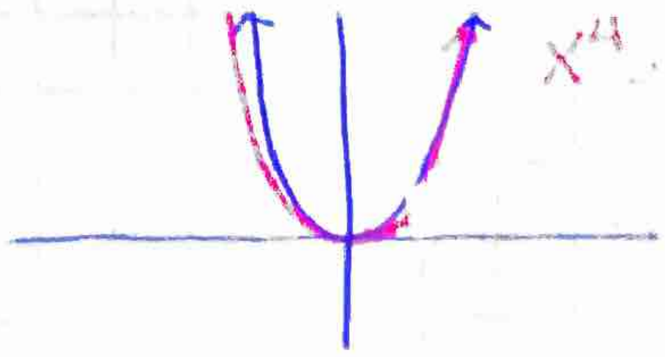
AAT

Intro to Polynomials

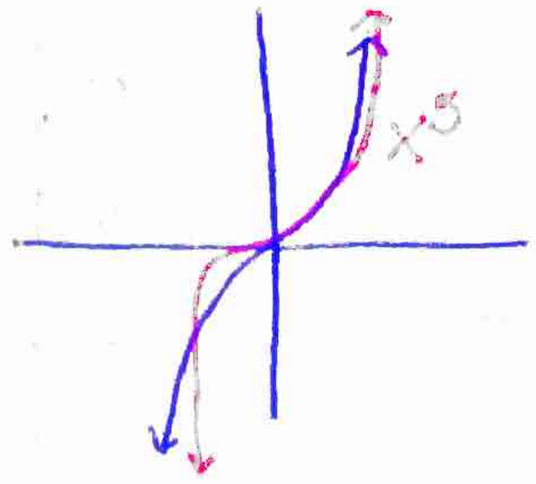
$y = x$ (degree 1)



even degree

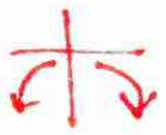


odd degree



end behavior * look at leading coefficient : degree

ex 1 $y = x^2 - 3x + 5x^4 \underbrace{-7x^5}$ LC: -7, D: 5 

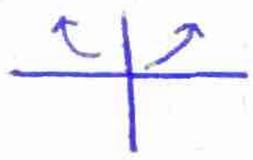
ex 2 $y = 3 - x^2 + 4x \underbrace{-2.3x^8}$ LC: -2.3, D: 8 

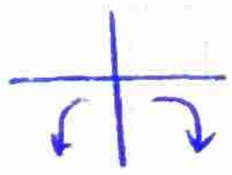
ex 3 $y = 2(x-4)^2(x+1)^2$

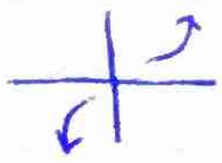
LC: 2, D: 4 

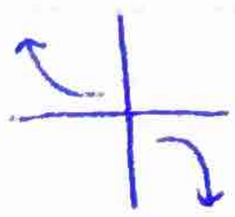
ex 4 $y = -(2x+1)^2(x-7)^3$

LC: -4, D: 5 

LC: +  up-up
D: even

LC: −  down-down
D: even

LC: +  down-up
D: odd

LC: −  up-down
D: odd

zeros/ multiplicity

* set each factor to zero
* quadratic formula
* multiplicity is the exponent

ex 5 $y = (x+7)^2(x-5)(x+3)^3$

$x = -7\ (2)$

$x = 5\ (1)$

$x = -3\ (3)$

ex 6 $y = 2x(x-1)(x+8)^4$

$x = 0\ (1)$

$x = 1\ (1)$

$x = -8\ (4)$

ex 7 $y = x^2 + 9x + 20$

$y = (x+5)(x+4)$

$x = -5\ (1)$

$x = -4\ (1)$

ex 8 $y = x^2 - 6x + 9$

$y = (x-3)^2$

$x = 3\ (2)$

ex 9 $y = 2x^3 + 4x^2 - 6x$

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

$x = 0\ (1)$

$x = -2 + \sqrt{7}\ (1)$

$x = -2 - \sqrt{7}\ (1)$

$x = \frac{-4 \pm \sqrt{16 - 4(1)(-3)}}{2}$

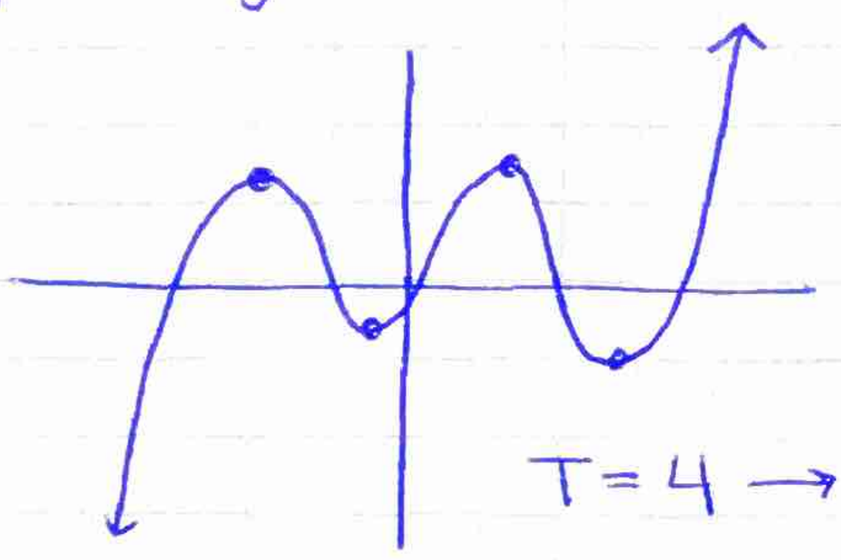
$x = \frac{-4 \pm \sqrt{28}}{2}$

$x = -2 \pm \sqrt{7}$

turning points

* number of max & min

always degree - 1



T = 4 → degree: 5