

Quiz Notes

factor by grouping

• works when you have a few pieces and/or it's not just x^2

① split the problem into 2 pieces: ex $3x^3 - 15x^2 + 6x - 30$

② what can you divide out of each piece? $3x^2(x-5) + 6(x-5)$

③ the () should match, they are 1 factor: $(3x^2 + 6)(x-5)$
the coefficients are the other factor

④ Am I done factoring? Is there more I can factor or divide out? $3(x^2 + 2)(x-5)$

end behavior

• need to know the degree & leading coefficient

standard form

$$y = 4x^3 - 5x^7 + x^2 - 10$$

Degree is biggest exponent (7)

L.C. is the # w/ the degree (-5)

factored form

$$y = 2x(2x+1)^2(x-3)^2(x-5)^3$$

Degree: add all the factor exponents (8)

L.C.: multiply all coefficients (4)

options for end behavior

D: even
LC: +



up-up

D: even

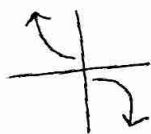
LC: -



down-down

D: odd

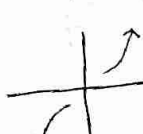
LC: -



up-down

D: odd

LC: +



down-up

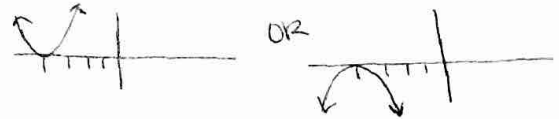
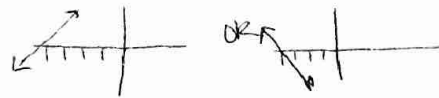
graph \rightarrow equation

- find the zeros (where the graph crosses the x-axis)
- plug in another point to solve for a

* with the zeros be careful the ~~#~~^{type} of zero (single, double, switchback)
b/c it affects the factor exponent

multiplicity / types of zeros

- $(x+4)^1$: exp. of 1, single root
- $(x+4)^2$: exp. of 2, double root
even exp. bounce (bounces)
- $(x+4)^3$: exp. of 3, triple root
odd exp. switchback (switchback)



equation \rightarrow graph

- just a sketch
- know end behavior & types of zeros to sketch

be careful

ex $y = 3x^1(x-1)^2(x+3)^4$
D: 7 zeros: $x = 1, -3, 0$
LC: 3 $\equiv 0$