

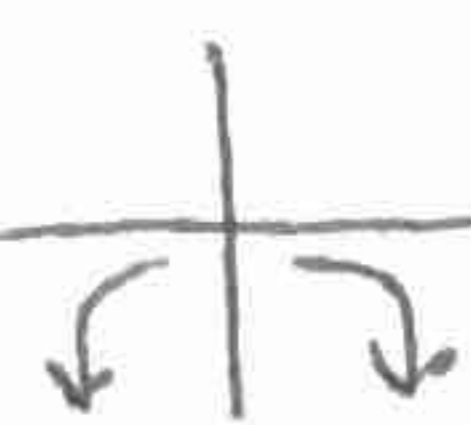
# Graph Polynomial Notes


## Things you need in order to graph

1. End Behavior  $\rightarrow$  leading coefficient and degree

LC D

LC: +  UP-UP  
D: even

LC: -  DOWN-DOWN  
D: even

LC: +  DOWN-UP  
D: odd

LC: -  UP-DOWN  
D: odd

2. The Zeros

\* set each factor to zero & solve!

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

$x-4=0$   
 $x=4$

$2x+3=0$   
 $x=-3/2$

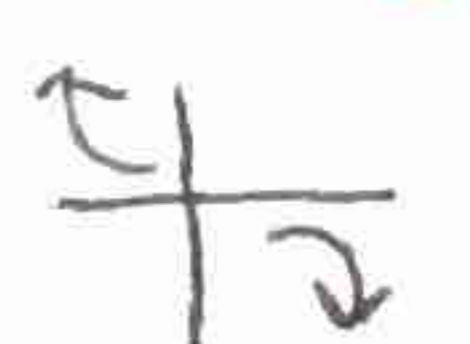
$x=-7$

**ex 1** standard form

$y = 4x^2 - 5x^9 + 10x - 4$

degree: biggest exponent (9)

LC: # w/ biggest exp (-5)


EB:  UP-DOWN

**ex 2** factored form

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

D: add all exponents ( $1+2+3=6$ )

LC: look at coeff. of ALL the x's multiply! ( $1 \cdot 1 \cdot 8 = 8$ )

EB:  UP-UP

**ex 4**  $y = x^2(x-5)(x+3)^2$

$x=0$

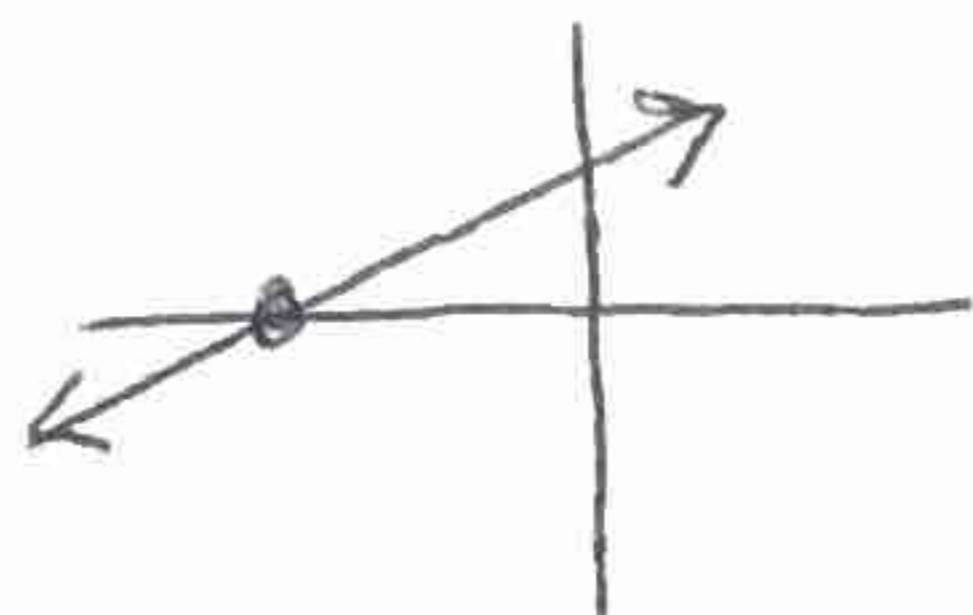
$x=5$

$x=-3$

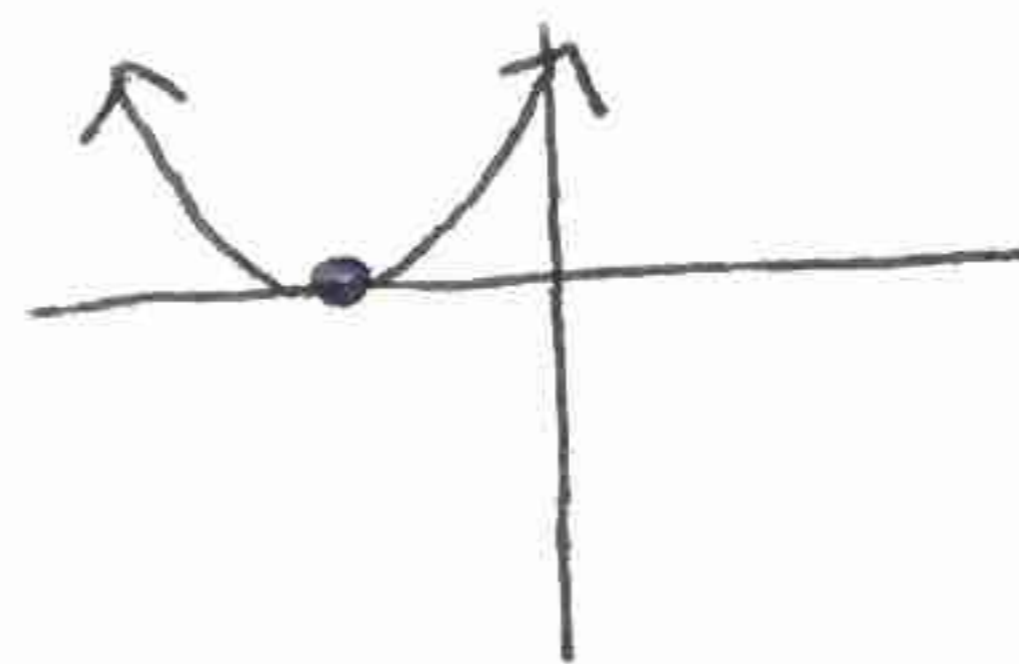
3. Multiplicity

\* look at exponent of each factor

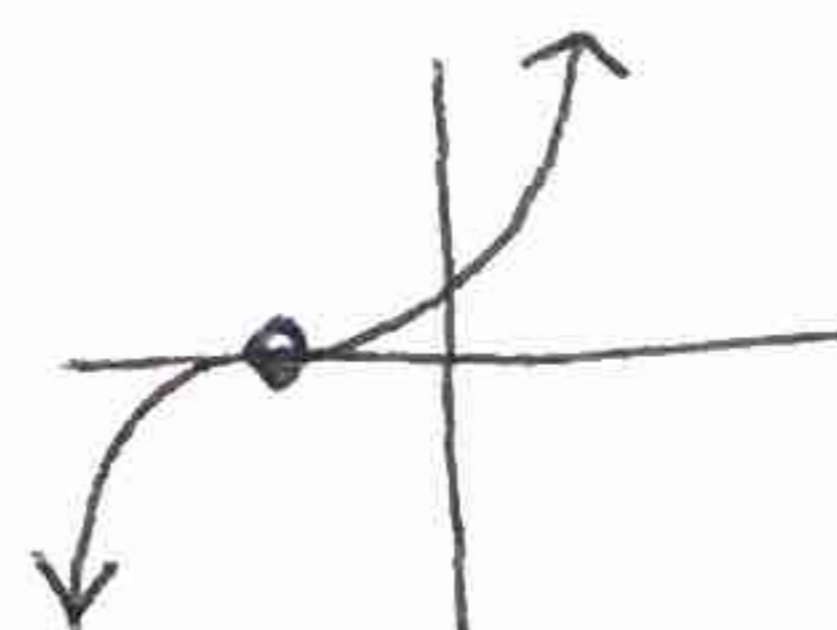
exponent = 1 single root



exponent is even double root (bounce)



exponent is odd except 1 switch back



**ex 5**  $y = x^2(2x+3)(x-5)^9$

$x=0$

(2) mult.  
bounce

$x=-3/2$

(1) single

$x=5$


(9) SB

Putting Everything Together! Graphing!

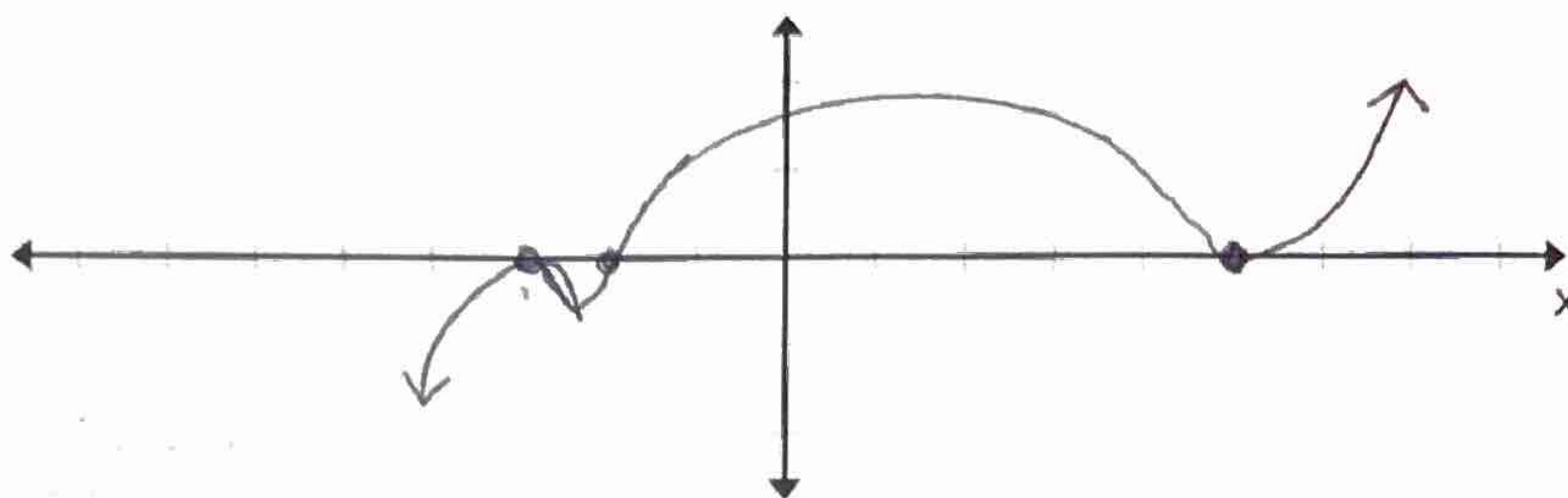
**ex 4** Graph  $y = (x+2)(x-5)^2(x+3)^2$

① end behavior.

D: 5  
LC: 1



down-up



② zeros (x-int)

$x = -2$      $x = 5$      $x = -3$

③ multiplicity

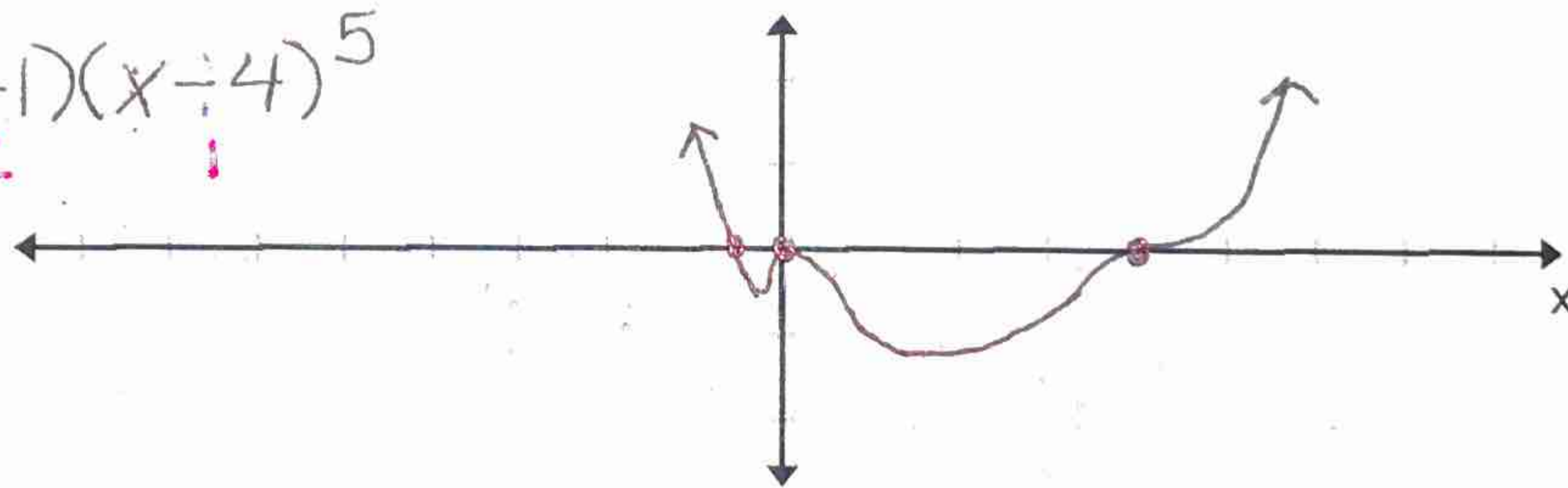
$x = -2$	$x = 5$	$x = -3$
(1)	(2)	(2)
single	bounce	bounce

**ex 7** Graph  $y = x^2(2x+1)(x-4)^5$

D: 8  
LC: 2



up-down



$x = 0$	$x = -1/2$	$x = 4$
(2)	(1)	(5)
bounce	single	SB

