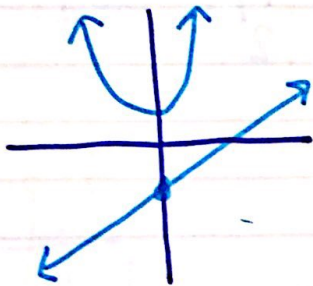


## M2H: Solving Systems of Quadratic Equations Graphically

Def: a system of nonlinear equations is a system where 1 or more equations involved is not a line.

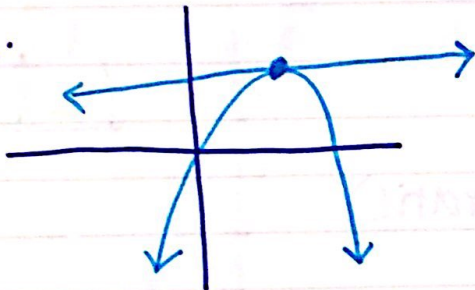
\* could have one, none, two, or several solutions.

Ex.



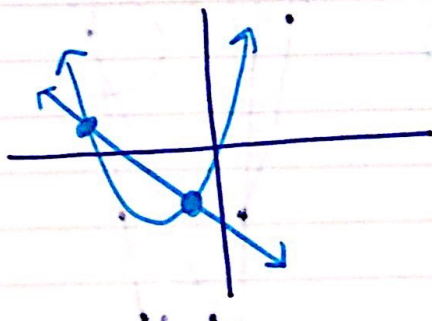
not intersecting at all  $\rightarrow$  no solution!

Ex.



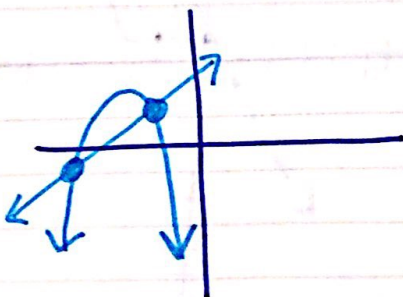
touches at one point  $\rightarrow$  one solution!

Ex.



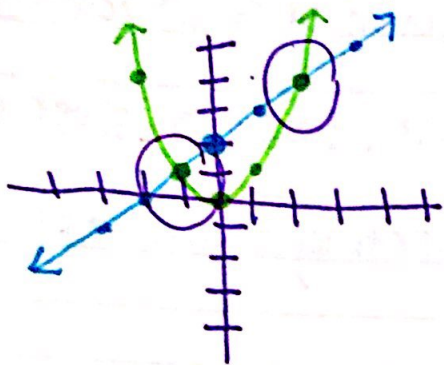
two points of intersection  $\rightarrow$  2 solutions!

Ex.



2 solutions!

Ex.  $f(x) = x + 2$  (linear)  
 $f(x) = x^2$  (quadratic)



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

Slope:  $1/1$   
 Y-int: 2

x	y
-1	1
0	2
1	3
2	4

up 1, over right 1

$f(x) = x^2$

Solutions:  $(-1, 1)$  and  $(2, 4)$

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

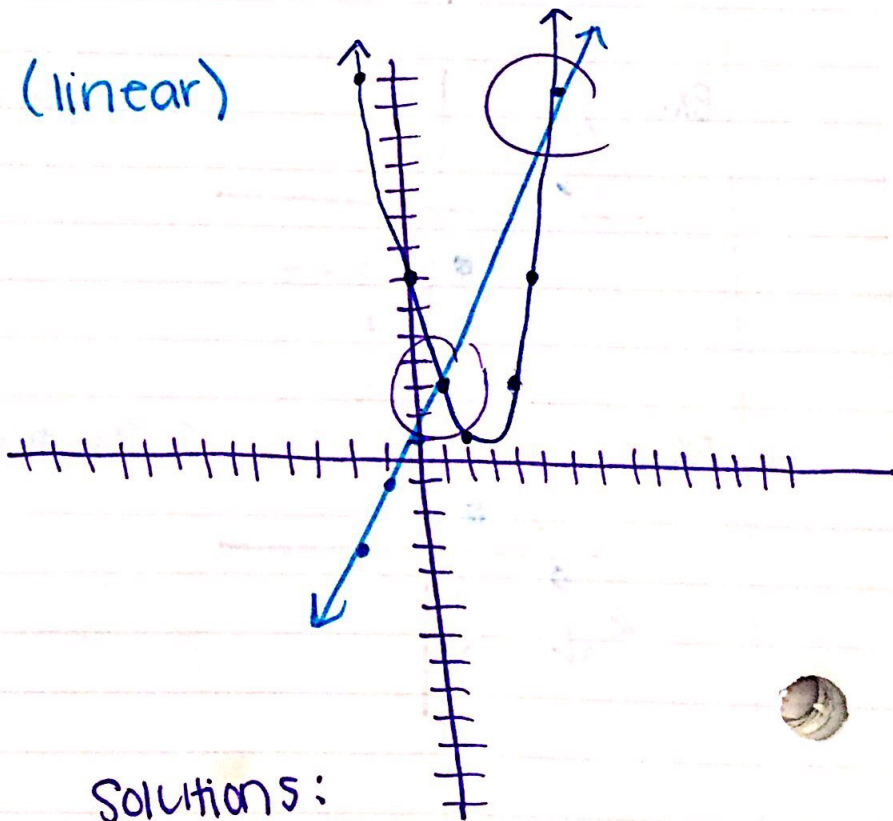
Ex.  $y = x^2 - 5x + 7$  (quadratic)

$y = 2x + 1$

(linear)

x	y
-2	21
-1	14
0	7
1	3
2	1
3	1
4	3
5	7
6	13

x	y
-2	-3
-1	-1
0	1
1	3
2	5
3	7
4	9
5	11
6	13
7	15
8	17
9	19
10	21



Solutions:  
 $(1, 3)$  and  $(6, 13)$