4.9 Investigating Lines in Other Forms

Part A: x + y = k

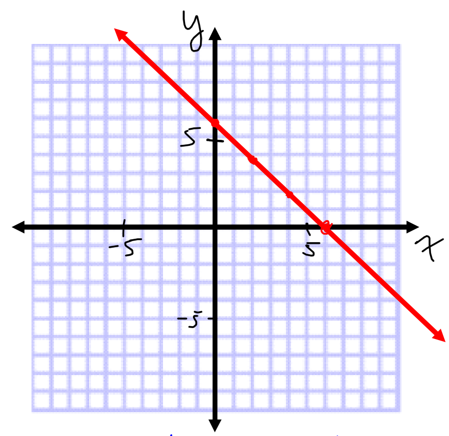
Ex. 1 Generate points for each equation, then graph the line.

a) $x + y = 6$

**include negative values too

X	Y
4	2
2	4
6	0
1	5
-3	9
-4	10

X	Y
0	6



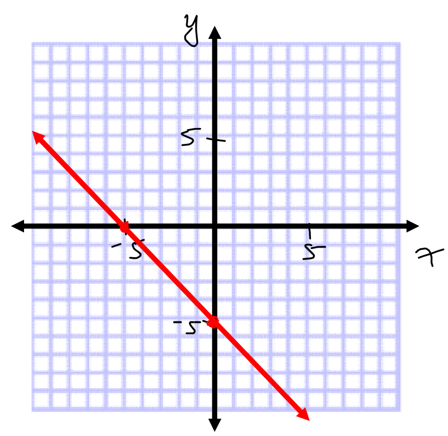
x-int= 6 y-int= 6

b) $x + y = - 5$

**include negative values too

X	Y
0	-5
-5	0

X	Y



x-int= -5 y-int= -5

Part B: x - y = k

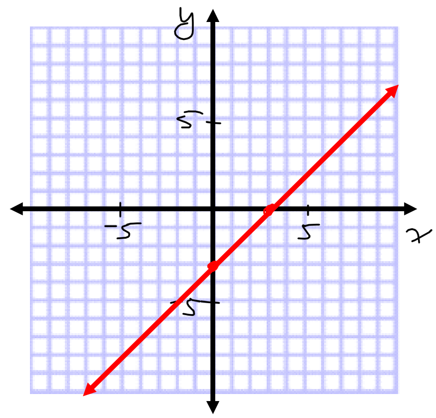
Ex. 2 Generate points for each equation, then graph the line.

a) x - y = 3

**include negative values too

X	Y
6	3
9	6
0	-3
3	0

X	Y



x-int= 3 y-int= -3

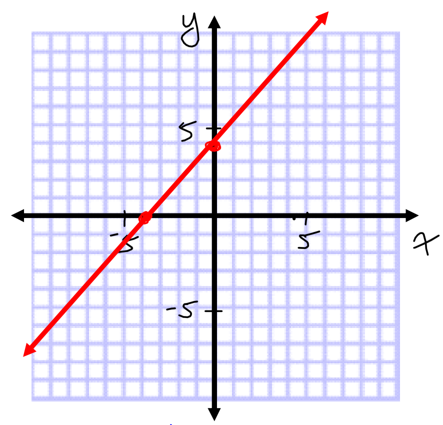
b) x - y = - 4

**include negative values too

x - 0 = - 4

X	Y
0	4
-4	0

X	Y



x-int= -4 y-int= 4

Summary:

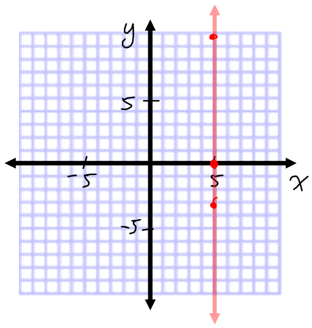
- x + y = k represents a linear relation with x=int= k and y-int = k
- x - y = k represents a linear relation with x=int= k and y-int = -k

Part C: x = k and y = k

Ex. 3 Generate points for each equation, then graph the line.

a) x = 5

X	Y
5	10
5	0
5	-3
5	1000



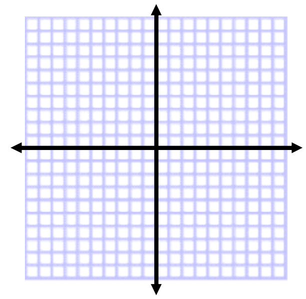
slope undefined

x-int. 5

y-int. None

b) x = -8

X	Y



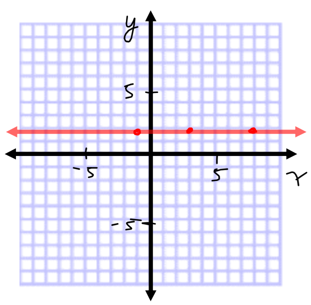
slope undefined

x-int. -8

y-int. None

c) y = 2

X	Y
-1	2
3	2
8	2



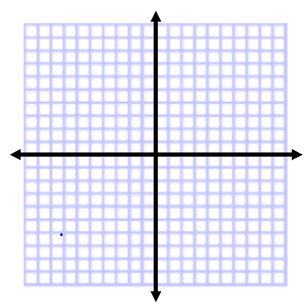
slope 0

x-int. None

y-int. 2

d) y = - 6

X	Y

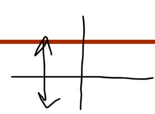


slope 0

x-int. None

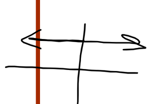
y-int. -6

Summary:



x = k represents a vertical **line with slope =** undefined

and x-int = K **y=int =** None



y = k represents a horizontal **line with slope =** Ø

and x-int = None **y=int =** K

Part D: $xy = k$

Ex. 4 Generate points for each equation, then graph the line.

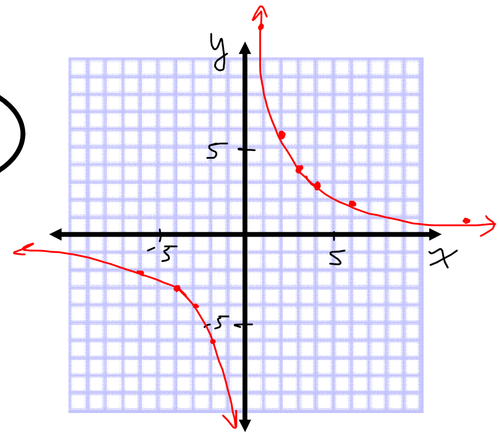
a) $x\,y = 12$

**include negative values too

**consider fractions too!!

X	Y
1	12
12	1
2	6
6	2
3	4
4	3

X	Y
-2	-6
-6	-2
-3	-4
-4	-3
$\frac{1}{2}$	24



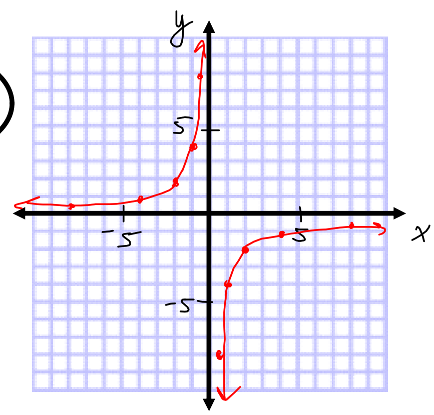
b) $x\,y = -4$

**include negative values too

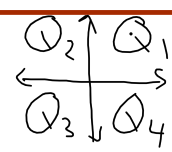
**consider fractions too!!

X	Y
-1	4
1	-4
-4	1
4	-1
-2	2
2	-2

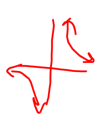
X	Y
$\frac{1}{2}$	-8
$-\frac{1}{2}$	8
8	$-\frac{1}{2}$
-8	$\frac{1}{2}$



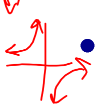
Summary:



- xy=k represents a non-linear relation



- when k is positive the relation is in quadrant 1 & quadrant 3



- when k is negative the relation is in quadrant 2 & quadrant 4
- x and y can never equal 0, this creates an imaginary boundary called an asymptote
- the relation gets closer and closer to the asymptote but never reaches it