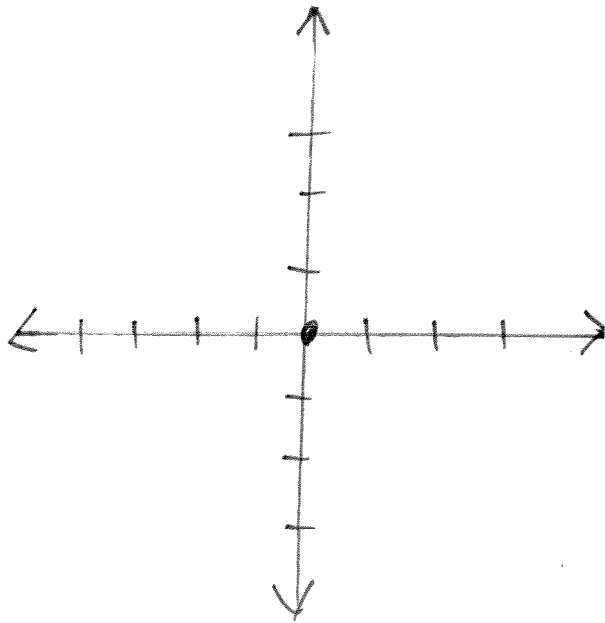# Chapter 4: Linear Equations

The Cartesian Plane (Coordinate system)

The Quadrants are labelled _____

The numbers in an ordered pair such as $(-4, 5)$ are used to locate the position of a point on the grid. The numbers of an ordered pair are called

_____.

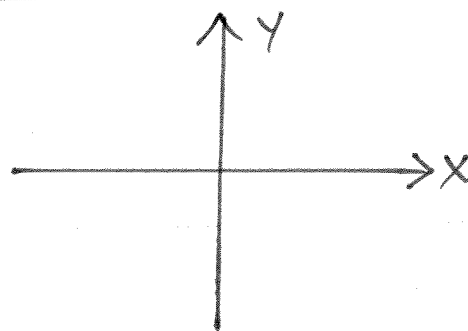A _____ is used to represent these coordinates, named by a _____ letter.

A $(-4, 3)$

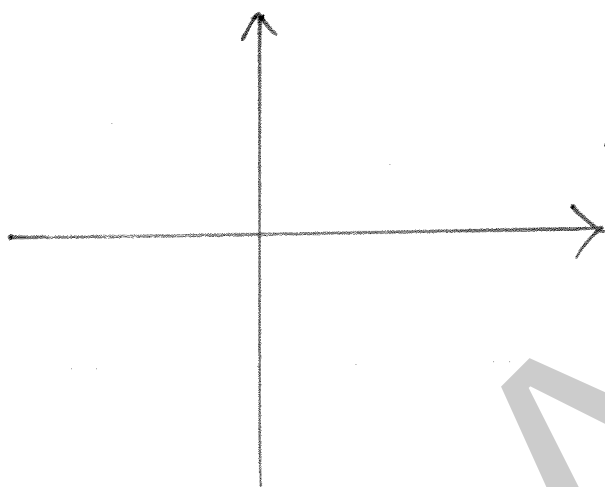2x: Plot the points
  A (2,4)   D (3,-2)
  B (-1,5)   E (0,3)
  C (-1,-1) F (3,0)

Find slope or rate of change
The slope of a line is a measure of
its _____

The bigger the slope,
the steeper the line.
If slope is $\ominus$, line is
_____
If slope is $\oplus$, line is
_____

slope formula $a = \dfrac{Y_2 - Y_1}{X_2 - X_1}$

  * You always need two points
    which you label as (X_1, Y_1)
                       (X_2, Y_2)

  * It doesn't matter which point
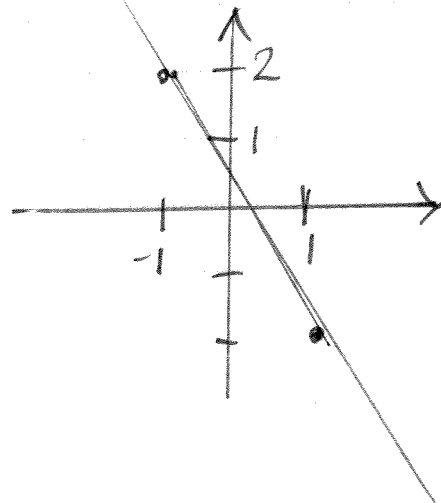   you choose first.

(Find slope)

FROM 2 POINTS $\quad (-4,6) \quad (-8,10)$

FROM A TABLE OF VALUES

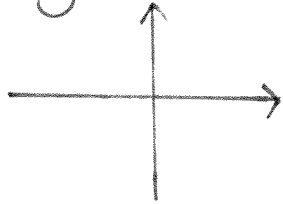| x	1	2	3
y	3	5	7

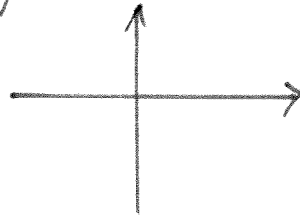FROM A GRAPH

Linear Equations

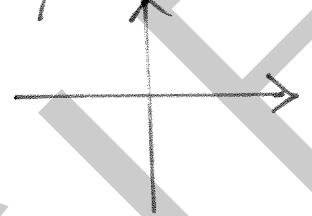The equation of a line is _____ .

y-intercept : _____

_____

ex: $y = 2x + 3$ $y = -1x - 2$ $y = 3x$

Types of Graphs
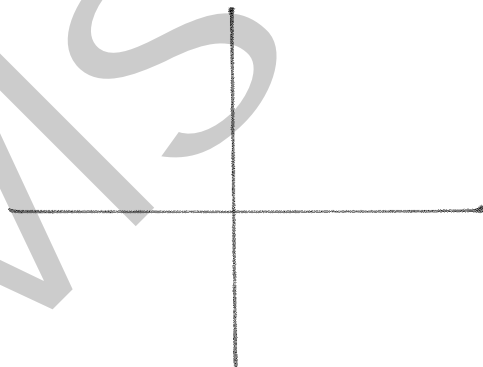
1) DIRECT: $y =$

x	
y	

ex:

Bob makes 6$ per hour.

2) PARTIAL:
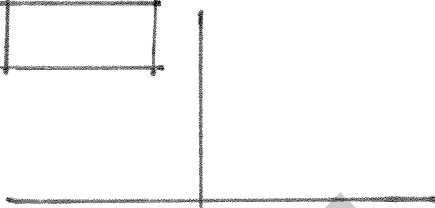
Bob makes 6$/hr plus a basic fee of 10$.

3) ZERO OR CONSTANT

Bus costs 3$ no matter where you get off.

4) UNDEFINED
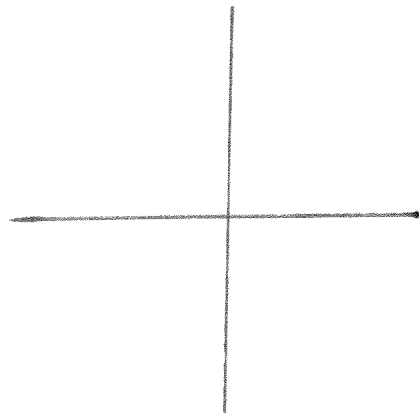
Parameters 'a' and 'b' in $y=ax+b$

Parameter 'a'

$y=1x+1$ $y=2x+1$ $y=3x+1$
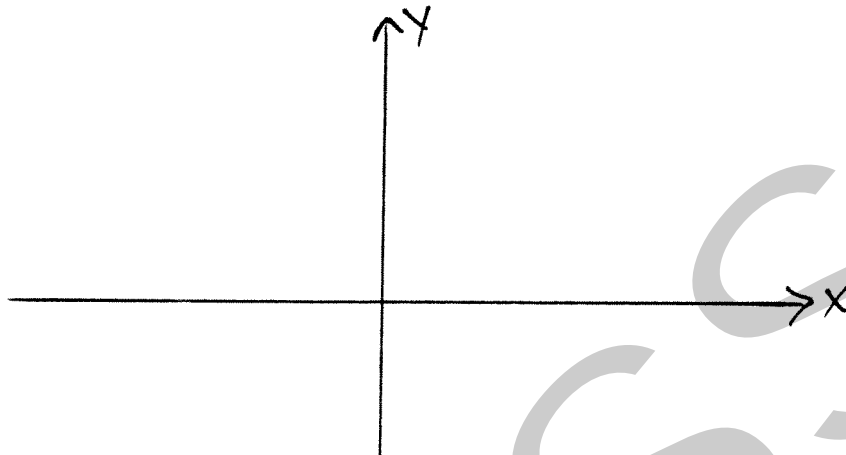
conclusion:

Parameter 'b'

$y=1x+2$ $y=1x-3$ $y=1x+5$
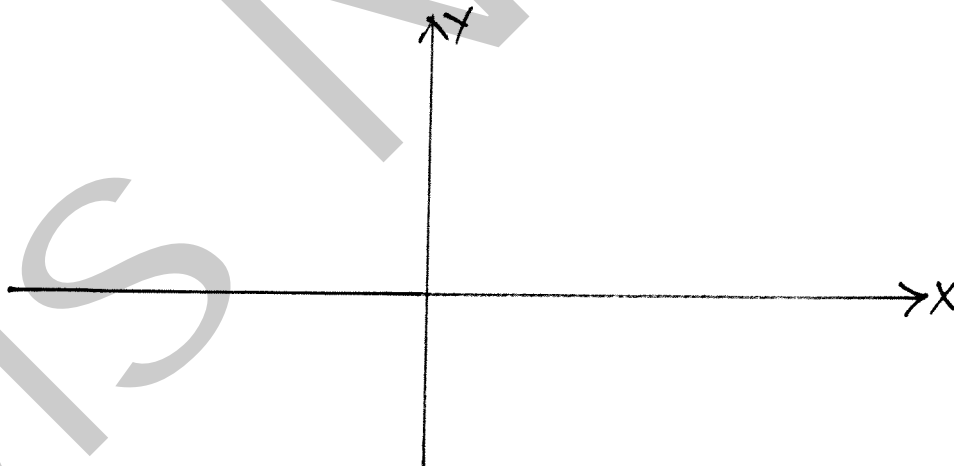
Conclusion:

Graphing an Equation

<u>Steps</u> 1) Make table of values

2) go by 1 unless there's a fraction. In that case, go by denominator.

3) Plot the points on TOV & connect.

example 1) $y = 2x + 5$

2) $y = -3x$

3) $y = 5$

5) $y = -\frac{3}{4}x - 2$

4) $x = -2$

Find equation ('b' is obvious)

Case 1 $(0, 40)$ $(10, 15)$

Case 2

X	0	5	10
y	10	30	50

Case 3

TYPES OF LINES

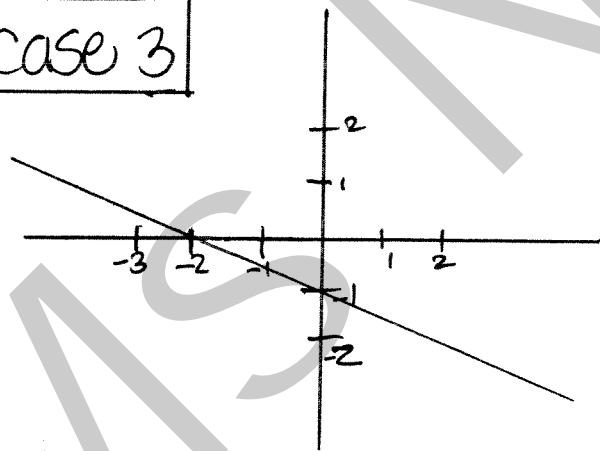| Direct	Partial	ZERO OR Constant

$Y=$ $Y=$ $Y=$

X	0	1	2
Y	0	3	6

X	0	1	2
Y	-1	1	3
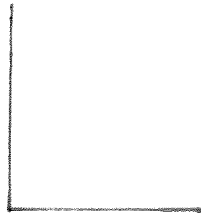
X	0	1	2
Y	5	5	5

* Special: * Special: * Special:

* Bob makes 6$ per hour
$y=$

* Bob makes 6$ per hour plus a basic fee of 10$
$y=$

* Bob makes 6$ no matter the number of hours worked.
$y=$

Finding the equation (solving for b)
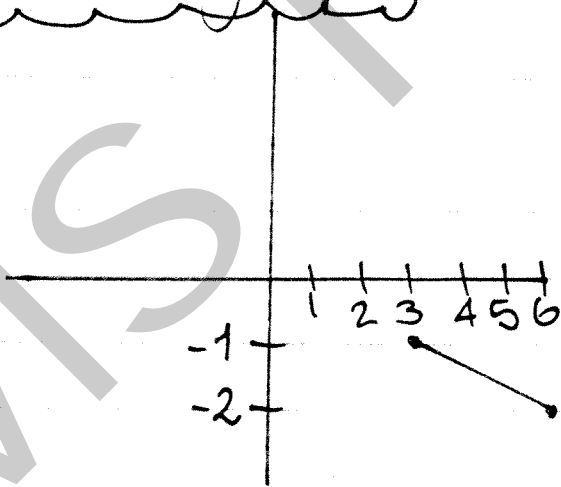
given 2 points:

ex: $(3,8)$ $(1,5)$

given a table of values

ex:

X	11	12	13
y	21	23	25

given a graph

ex:

Chapter 6: Rational Function

The equation is $Y=$

The graph looks like :

Graphing

Graph $Y = \dfrac{50}{X}$

Steps 1) Make table of values
2) Do not choose 0 .

Word Problems:

ex: A 1000$ prize must be shared equally among the employees of a company.

a) How much will each of the 20 employees obtain?

b) graph the Rule

c) If each obtains 10$, how many employees are there?

ex: The school requires 500 hours of paint job.

a) find the equation
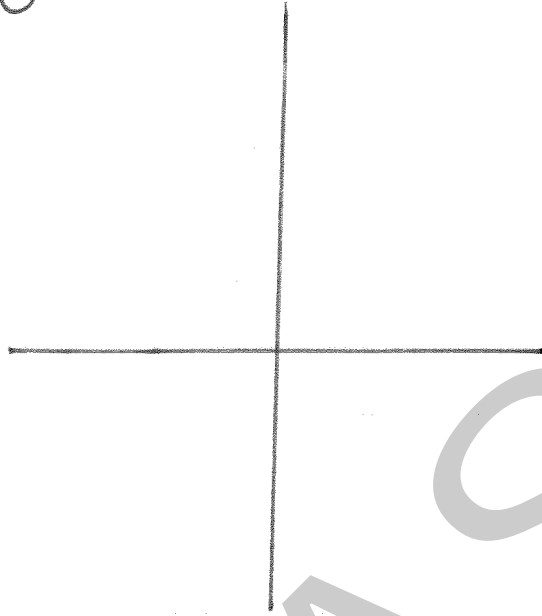
b) Draw the graph.

Chapter 5: System of Equations.

Graphical Method
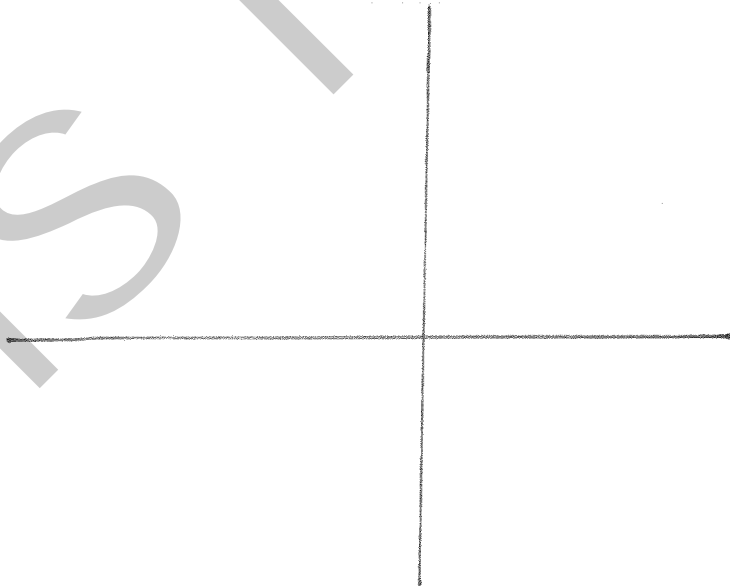
Find POI of 2 equations

ex: $y = 3x - 6$ $y = -2x + 4$

ex: $y = \frac{2}{3}x + 1$ $y = -\frac{1}{3}x + 4$

Comparison Method.

Finding POI of 2 equations

ex: $y = -2x + 4$ $\qquad\qquad$ $y = 3x - 6$

ex: $y = \dfrac{2}{3}x + 1$ $\qquad\qquad$ $y = \dfrac{1}{3}x + 4$

ex: $y = \dfrac{2}{5}x + 5$ $\qquad\qquad$ $y = \dfrac{1}{4}x + 20$

WORD PROBLEMS

1) Joey is an actor and makes 9$/hour and a Bonus of 18$.
   Ross is a professor and makes 15$/hr.

   a) Find the 2 equations

   b) When will Joey and Ross have the same salary?

   c) Who makes more money after 60 hours of work?

2) Two car rental companies are:
   Company A charges $0.30 per kilometer.
   Company B charges a base fee of 30$ plus $0.20 per kilometer.

   a) After how many kilometers will both companies charge the same amount?

   b) Which company is the better deal after 500 km?