

# Math 10 Chp 8.1

Note Title

2017-02-02

## Systems of Linear Equations and Graphs

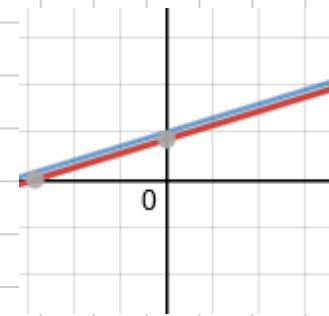
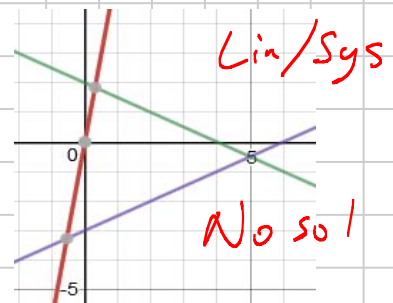
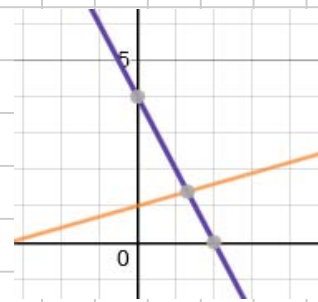
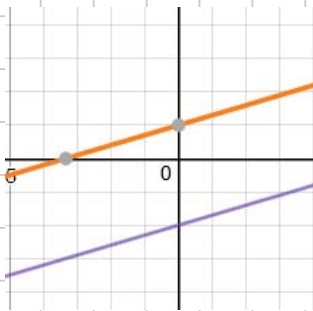
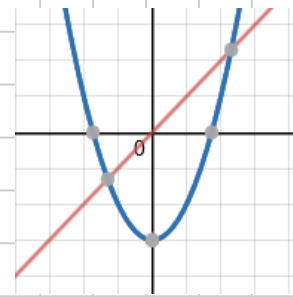
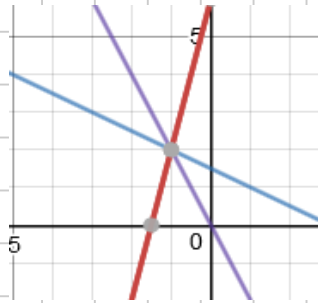
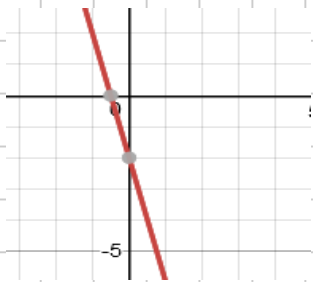
Definitions:

**System of Equations** - two or more equations with common variables.

**Point of Intersection** - a point where equations join.

**Solution** - a point where given equation join.

eg) Which graphs show systems of linear equations?



Circle and give approximate coordinates for solutions.  
How many solutions are possible?

Solving from tables - simply find matching y-values if the tables are aligned.

x	L1	L2
-4	-13	12
-3	-10	10
-2	-7	8
-1	-4	6
0	-1	4
1	2	2
2	5	0
3	8	-2
4	11	-4

If the tables are unaligned, you must find matching points.

x	L1	x	L2
-4	11	-2	-3
-3	10	-1	-1
-2	9	0	1
-1	8	1	3
0	7	2	5
1	6	3	7
2	5	4	9
3	4	5	11
4	3	6	13

Tables do not always find solutions! For instance if you use integers for the independent variable and solution is a decimal value, you will miss the solution!

Checking Solutions - substitute the point into given equations. All must be true for a valid solution.

$$y = 2x - 4$$

$$x + y = 5$$

$$x - 2y + 1 = 0$$

Which point is the valid solution?

$(1, 1)$ ,  $(0, 5)$ ,  $(3, 2)$

Assigned Work: pp. 426-431: 1-4, 5ac, 6, 7 (tech), 10, 11

Challenge: 14, 15, 19

# Math 10 Chp 8.2

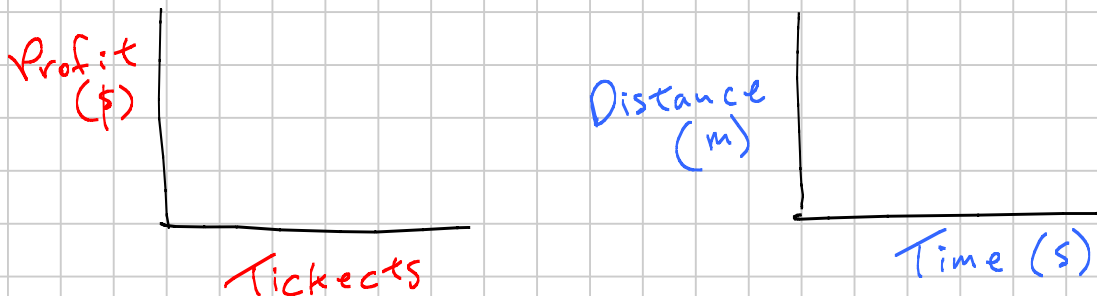
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## Modelling and Solving Linear Systems

### Modelling Equations Tips -

From a graph



You can see the independent ( ) and dependent ( ) variables. The slope is rise/run ( ).

When you read a word problem, the sentences give you clues about the independent/dependent variables by finding the slope.

eg) slope - \$5 per day  
reciprocal slope - necklace for \$6 -

slope - \$2 to make each necklace -

slope - 48 km/h -  
reciprocal slope - litre of gas for \$1.18 -

slope - 20 feet in 30 seconds -

Don't overgeneralize, but 'per', 'each', 'in' usually means divide which gives us the slope. There is no easy generalization to detect a reciprocal slope.

Other math synonyms - again, don't over-generalize!  
Add - sum, total, increase, gain, more, plus, tally, above

Subtract - difference, decrease, reduce, deduct, discount, less, take away, lose, below

Equals - is, will be, was, are

Multiply - times, scale, magnify, of, product

Divide - per, each, portion, partition, group, divvy, quotient

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Variables - don't get stuck using  $x$  and  $y$ . Use appropriate letters - usually the first letter unless it conflicts with another variable

distance -

time -

profit -

Sales -

dimes -

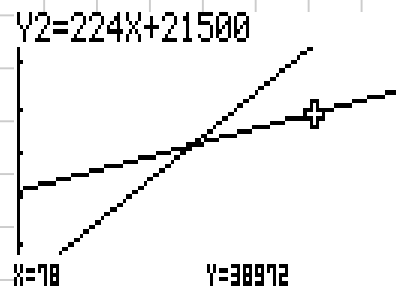
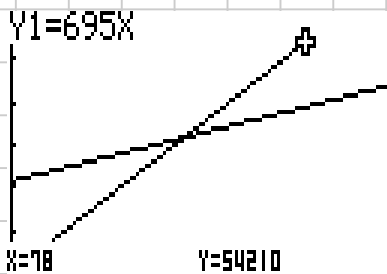
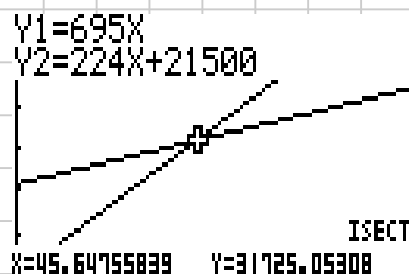
quarters -

cost -

age -

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eg) The average revenue from iPhones in 2017 Q1 was \$695. The average cost to produce them was \$224. There are also fixed costs of \$21,500 million for infrastructure and marketing. Create a revenue and a cost equation. How many iPhones need to be sold to break even? Apple sold 78 million iPhones in 2017 Q1, how much profit did they make?



Assigned Work: pp. 440-445: 1-4, 14, 19

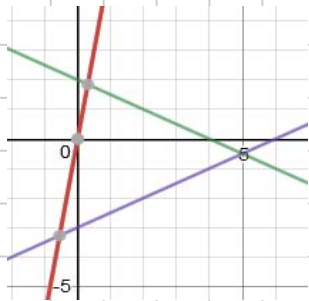
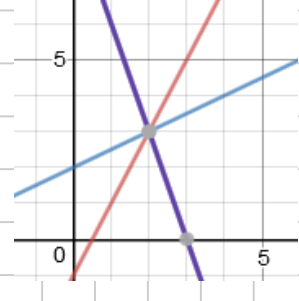
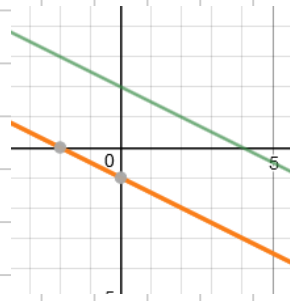
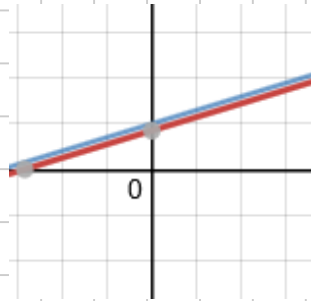
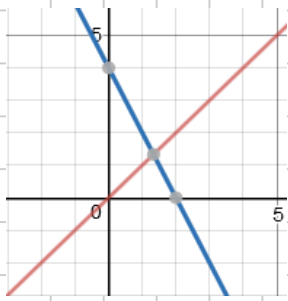
Challenge: 22, 23

# Math 10 Chp 8.3

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## Number of Solutions for Sys of Lin Eqns.



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## Enrichment - Classifying Systems of Equations

# of Variables vs # of Equations.

- if  $v > e$ , it is
- if  $v = e$ , it is
- if  $v < e$ , it is

### Solutions

- if no solution, the system is
- if solution exists, the system is

### Dimensions

- if we have a single variable equation, it represents
- " two "
- " three "

To determine the number of solutions algebraically, we need to put all the equations in the same form.

- different slopes -

- same slope / same intercepts -

- same slope / different intercepts -

eg) How many solutions?

$$y = \frac{5}{3}x + 2$$

$$5x - 3y + 6 = 0$$

$$4x + 3y + 7 = 0$$

$$y - 2 = 5(x - 3) = 0$$

$$y = -2x + 5$$

$$2x + y = 3$$

$$5x + 10y + 3 = 0$$

$$y = -\frac{1}{2}x + 8$$

$$12x - 4y + 16 = 0$$

$$y = 3x + 4$$

# 11, 12, 19

Assigned Work: pp. 454-459: 1-4, 6, 9, 10, 14

Challenge: 16, 17