Note: IB calls it Simultaneous Equations

# System of equations: graphing +substitution + elimination

Page **DONE**2-16 (only even)
Page **DONE**4-26 (only even)
4-14(only even)

HOMEWORK due before quiz on Thursday, Nov. 8: LOG INTO www.myimaths.com and finish the Review Worksheets I have set up for you in this online program.

DON'T FORGET TO LOGIN WITH YOUR PASSWORD I GAVE YOU TODAY

### Overview

• 1 variable  $\rightarrow$  1 equation

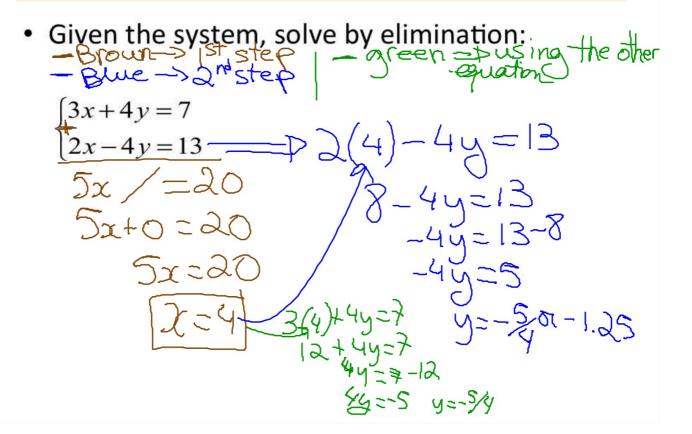
$$2x + 10 = 5$$

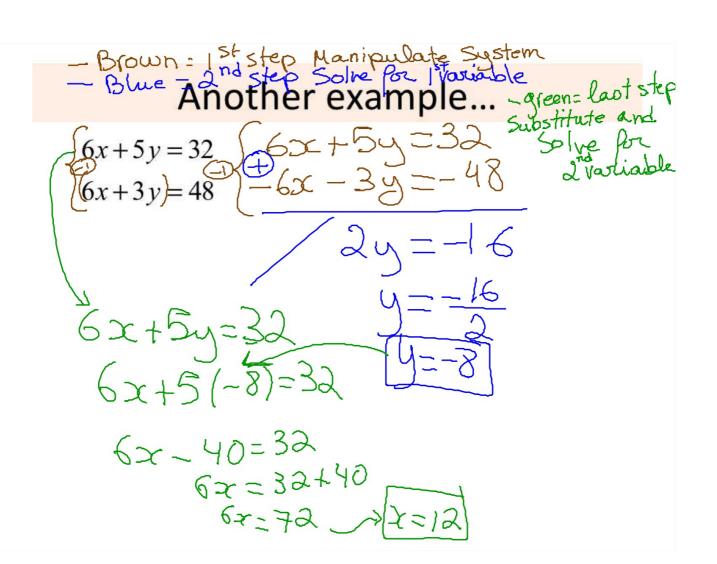
2 variables 2 equations

## The Elimination Method

- Objectives
  - Use the elimination method to solve a system of equations
  - The elimination method uses opposites to eliminate or of the variables
  - Choose an appropriate method to solve a system of equations

### The Elimination Method





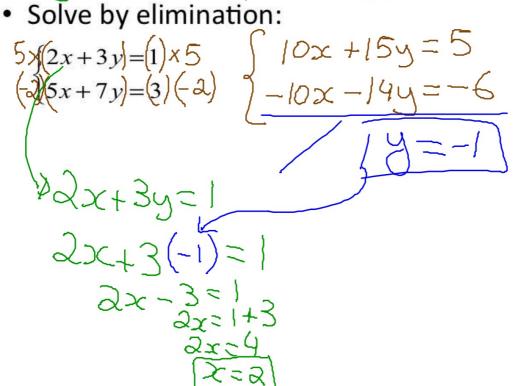
Brown = 1st step = manipulate sustern

What if they don't match?!?!? For the other

Green = last step = substitute Ivariable and solve

Solve by elimination: (xy(2x-y)=7(x4)) = 3x - 4y = 38 (5x+4y=11) = 3x + 4y = 11 3x = 39 2(3)-y=7 -y=7-6 -y=7-6

# Brown = 1st step = Manipulate System Blue = 2nd step = Eliminate Increable and Solve for What if they don't match?!?!? the other - green = Last step = Substitute and solve 2nd variable



It does not matter if you manipulate the equation differently as far as you are able to ELIMINATE a variable. See below, same system as previous slide.

$$(7)(2x+3y)=1(7)$$

$$(-3)(5x+7y)=3(-3)$$

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NOTE: remember some book like to give the answer as the coordinates of a point (2,-1)
$$(2,-1)$$
This point will be which point point exprint exprint

**NOTE: remember some books** like to give the answer as the coordinates of a point

(2, -1)

This point will be which point???

point of intersection

# Choosing a Method

Example	Method	Why
6x + y = 10 $y = 3x + 5$	Substitution	The "y" is already isolated in one of the equation
2x - 5y = -20 $4x + 5y = 14$	elimination	bc the "-5y" and "5y" would easily <u>eliminate</u> when we add the 2 equations
8a-2b=-11 8a-4b=25	Most students would use ELIMINATION.  Owever, some may want to use SUBSTITUTION y isolating the "b" in 1st equation.	It is fairly easy to manipulate the system by multiplying 1st equa. by  (-2)
$y = 3x + 2$ $y = -\frac{1}{4}x + 7$	SUBSTITUTION, using the y-method OR GRAPHING, if you have graphing paper.	bc the equation are given in the form of y=mx+b

What is the point of learning this? --> SOLVE WORD PROBLEMS (real life situations)

### More examples of one equation or Simultaneous!

You can also solve by substitution by isolating

the x or y in 1st equation (i.e. y=9-x)

Take a rectangle where one side is 3cm longer than the other. If the perimeter is 30cm, what is the length of each side.

l= length of the o l= 3+5 30=25+2f

Now solve by substitution. Take (3+s) and put it in the second equation instead of  $\ell$ 

#### Rent-a-Car

Deema and Ramzi both rent cars from the same agency. The agency rents cars a daily fee and a mileage fee. Deema rented the car for 3 days and drove the car 450 miles. Ramzi had a car for 6 days and drove his car 600 miles. Deema had to pay 1275dhs, while Ramzi had to pay 1950dhs. What was the cost per day and the mileage charge?

d=price daily (dhs) m=price per mile (dhs) (1275=3d+450m 1950=6d+600m

Now solve by elimination by multiplying 1st equation by (-2)