

Introduction 2x2 Systems of Equations

We begin the course with a short, preliminary example.

I think that this is something that you have done in a previous class.

But if not, no big deal.

It's not too hard.

And you get to try one yourself.

2x2 System of Equations

$$\left\{ \begin{array}{l} 1x + 3y = 9 \\ 2x - 4y = -2 \end{array} \right.$$

- 2 equations
- 2 unknowns

Find x and y that make both equations true, simultaneously

I. ① solve for one variable

$$x = 9 - 3y$$

② substitute into other equation

$$2(9 - 3y) - 4y = -2$$

$$18 - 6y - 4y = -2$$

$$18 - 10y = -2$$

$$-10y = -20$$

$$y = 2$$

$$x = 9 - 3 \cdot 2$$

$$= 9 - 6$$

$$x = 3$$

solution $(3, 2)$

II. Elimination

$$x + 3y = 9$$

$$2x - 4y = -2$$

$$-2x - 6y = -18$$

$$-10y = -20$$

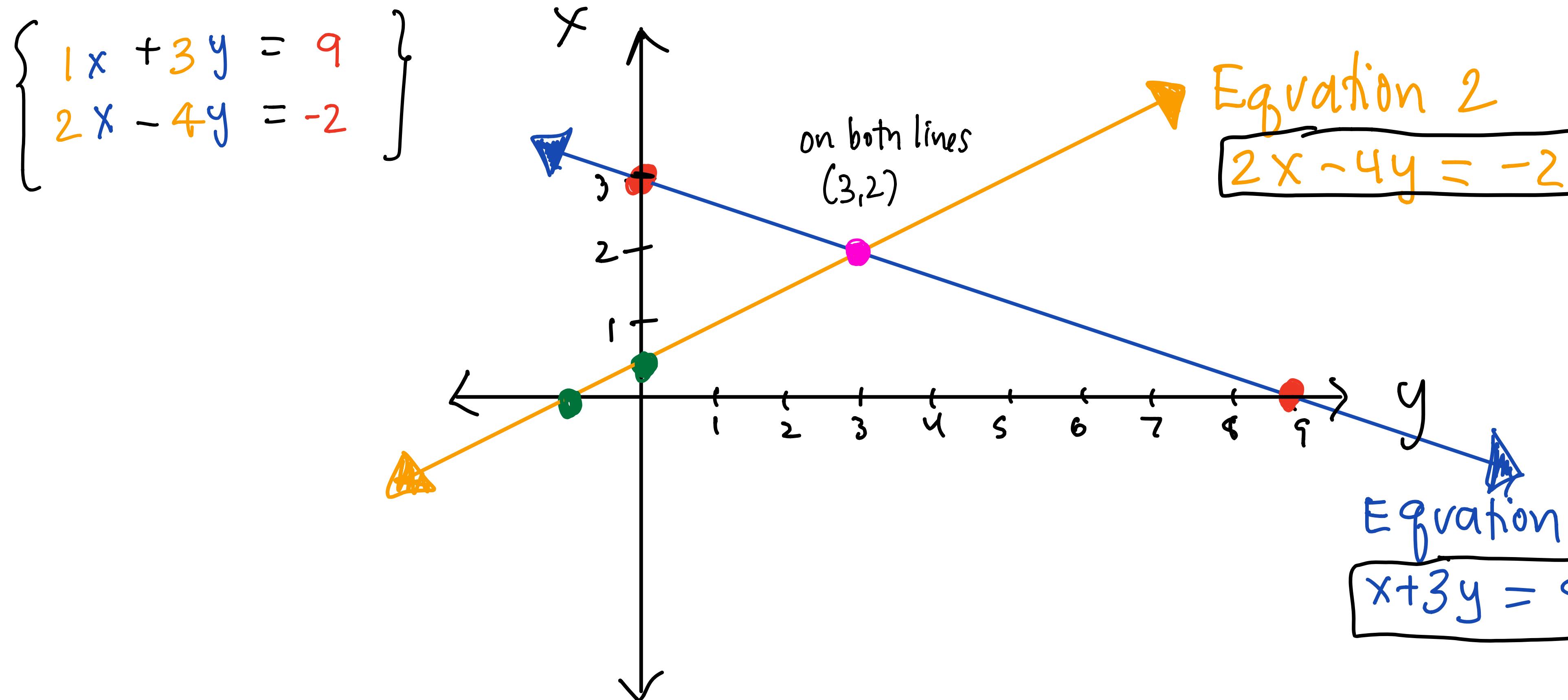
$$y = 2$$

mult by -2

add

continue as in part I

Geometry of *Linear* Equations



$$\left\{ \begin{array}{l} 4x - y = 9 \\ x + y = 7 \end{array} \right.$$