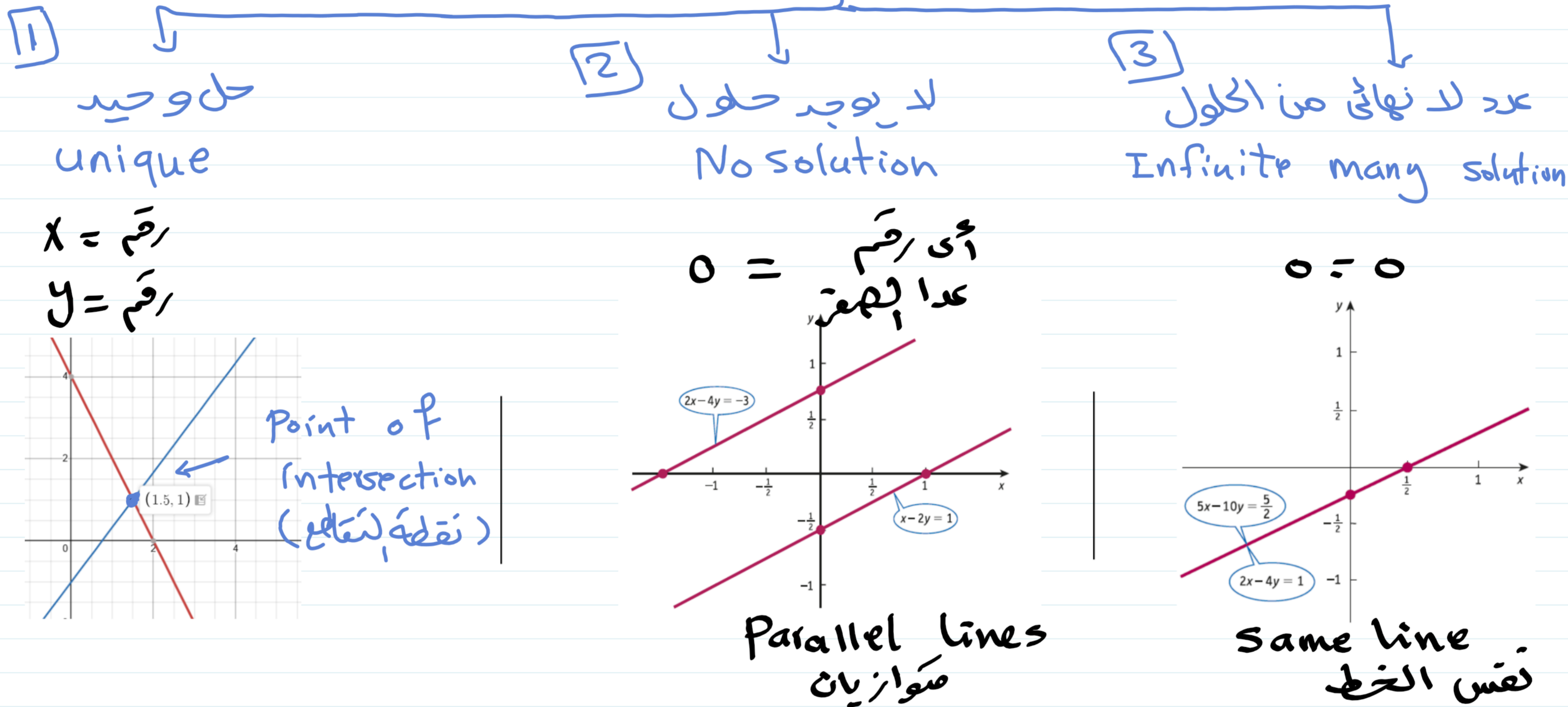


(system of equations)

ازای حل عدالتین أو اکثر بطریقه حذف Elimination

انواع حلول



شرح طریقه حذف Elimination

تاخذ اعداد ده توضع به

Ex solve

$$2x + y = 4$$

$$4x - 3y = 3$$

خطوات تصحيح لجميع المسائل:-

1- نحدد الأرقام الأسهل [الأصغر] أمام x أو y

(في هذا المثال سنهتفره لأن الأرقام كلها صغيرة بس نرجع هنا y)

Step 1

$$2x + y = 4$$

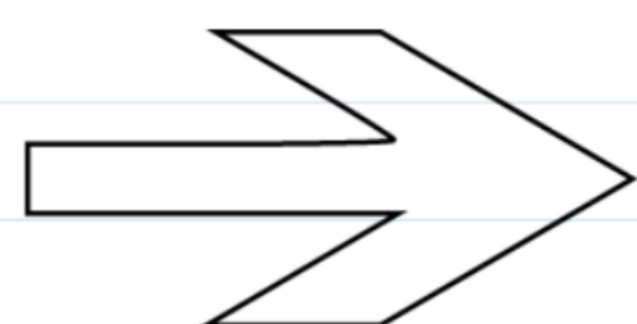
$$4x - 3y = 3$$

2- نعمل عملية الحذف ونعكس إشارة إحدى المتغيرات وليس كلاهما ثم نصرف

Step 2

$$+3 \quad 2x + y = 4$$

$$1 \quad 4x - 3y = 3$$



$$6x + 3y = 12$$

$$4x - 3y = 3$$

$$\begin{aligned} 6x + 3y &= 12 \\ 4x - 3y &= 3 \end{aligned}$$

$$10x = 15$$

$$x = \frac{15}{10} = 1.5$$

٤- عوض بأي معادلة من مسألة الجار قيمة y (اختاري) (مثلاً)

$$2(1.5) + y = 4$$

$$3 + y = 4$$

$$y = 4 - 3 = 1$$

الحل هو

$$\begin{aligned} x &= 1.5 \\ y &= 1 \end{aligned}$$

حلولية unique

(خطان متقاطعان)

يمكن نتأكد عن طريق التلخيص
 النتائج لتزاي من المحاور
 Mode $\rightarrow 5 \rightarrow 1$

Example

Solve the system of equations

$$\begin{aligned} -2x - 2y &= 1 \\ 1 \quad 2x - 4y &= -3 \end{aligned}$$

$$\begin{aligned} -2x + 4y &= -2 \\ 2x - 4y &= -3 \end{aligned} \quad \text{Add}$$

$$0 = -5 \quad \text{[No solution]}$$

Parallel lines

لا يوجد حل
 هنا خطان متوازيان

Example

Solve the equations

$$\begin{aligned} -5 \quad 2x - 4y &= 1 \\ 2 \quad 5x - 10y &= 5/2 \end{aligned}$$

$$\begin{aligned} -10x + 20y &= -5 \\ 10x - 20y &= 5 \end{aligned} \quad \text{Add}$$

$$0 = 0$$

(Infinitely many solutions)

هناك متطابقان equations are for same line

سؤال اختياري

The system ;

$$3x - 6y = 2$$

$$x - 2y = \frac{2}{3}$$

$$\begin{array}{r} -1 \\ 3 \\ \hline \end{array} \begin{array}{l} x - 6y = 2 \\ x - 2y = \frac{2}{3} \\ \hline \end{array}$$



$$-3x + 6y = -2$$

$$3x - 6y = 2$$

Add

$$\begin{array}{r} -3x + 6y = -2 \\ 3x - 6y = 2 \\ \hline 0 = 0 \end{array}$$

- a. has two solutions
- b. has infinitely number of solutions
- c. has three solutions
- d. has no solution

ممكن اشتغل بنفس خطوات الطريقة كذا

If the following system of linear equations has infinitely number of solutions :

$$2x + 3y = 4$$

$4x + 6y = k$, then the value of k is :

- a. 10
- b. 4
- c. 8
- d. 6

4

$$2x + 3y = 4$$

2

$$4x + 6y = k$$



$$\cancel{-8x} - \cancel{12y} = -16$$

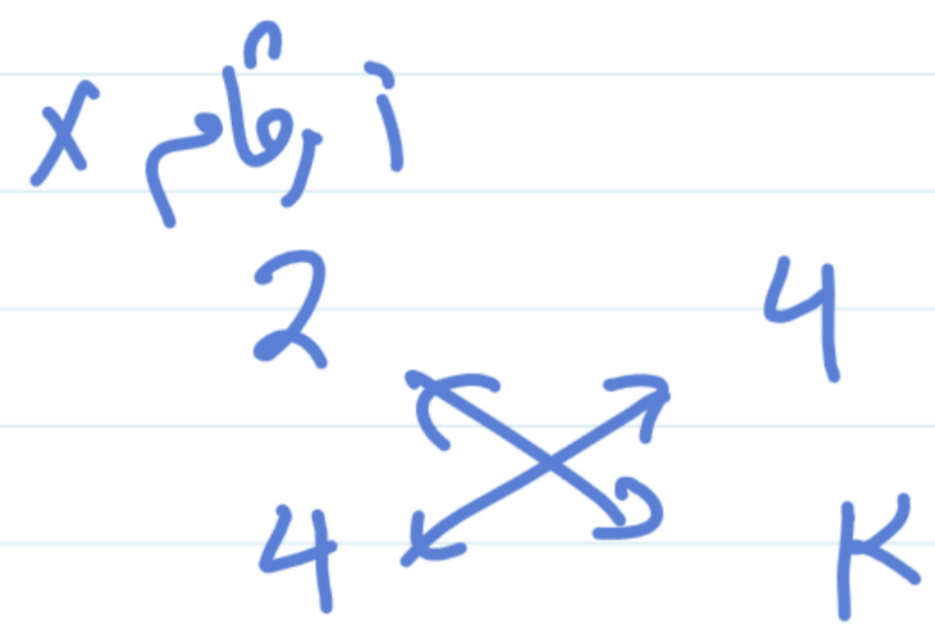
$$\cancel{8x} + \cancel{12y} = 2k$$

$$0 = -16 + 2k$$

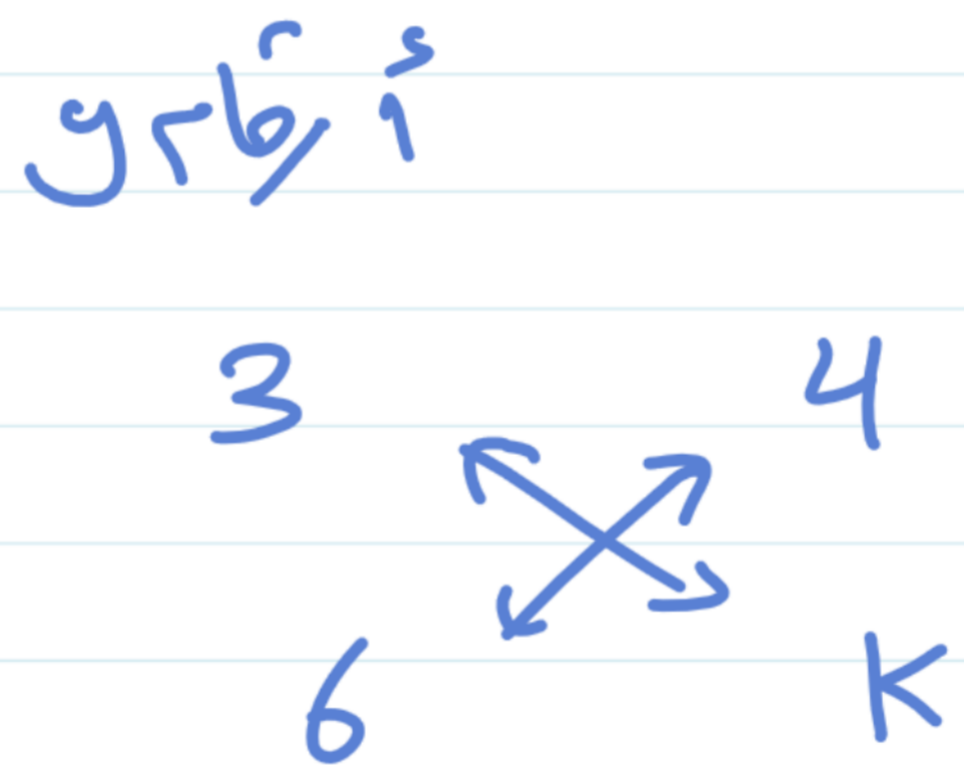
$$\frac{16}{2} = \frac{2k}{2}$$

8 = k

الطريقة أسرع



$$k = \frac{4 \times 4}{2} = 8$$



$$k = \frac{4 \times 6}{3} = 8$$

Exercise 1.4*

2. Write down a possible set of values of the numbers a and b for which the simultaneous equations:

- (a) $2x + 3y = 4$ have infinitely many solutions
 $ax + 6y = b$
- (b) $4x - 6y = 1$ have no solutions
 $2x + ay = b$

a) $a = 2 \times 2 = 4$
 $b = 4 \times 2 = 8$

b) $a = -6 \times \frac{1}{2} = -3$

$b \neq 1 \times \frac{1}{2}$

$b \neq \frac{1}{2}$ [b takes any number except $\frac{1}{2}$]



لحام

موجود في البتريج

4. Solve the following systems of equations:

(a) $x - 3y + 4z = 5$ (1)
 $2x + y + z = 3$ (2)
 $4x + 3y + 5z = 1$ (3)

① & ②
 $x - 3y + 4z = 5$
 $6x + 3y + 3z = 9$

 $7x + 7z = 14$
 $x + z = 2 \rightarrow$ ④

① & ③
 $x - 3y + 4z = 5$
 $4x + 3y + 5z = 1$

 $5x + 9z = 6 \rightarrow$ ⑤

③
Solve ④ & ⑤
 $x + z = 2 \rightarrow$ ④
 $5x + 9z = 6 \rightarrow$ ⑤

Multiply ④ by 5
 $5x + 5z = 10$
 $5x + 9z = 6$

 $-4z = 4$
 $z = -1$
 $x - 1 = 2$
 $x = 3$

④
بالتعويض قيم المتغيرات، نحصل
 $\therefore 2(3) + y - 1 = 3$
 $6 + y - 1 = 3$
 $5 + y = 3$
 $y = 3 - 5 = -2$

$x = 3$
$y = -2$
$z = -1$

