

雙語教學主題(國中七年級教材): 以加減消去法和帶入消去法解二元一次聯立方程式

Topic: soving systems of linear equations in 2 variables by using elimination and substitution methods

下面是這個單元需要用到的單字，請老師們先行熟悉單字

Vocabulary，

Variable 變數，元

isolate

linear equation

systems of linear equations

一次方程，線型方程

一次聯立方程

Elimination (加減)消去法

substitution (代入)消去法

add (addition):

substract (substraction):

multiply (multiplication):

divide (division)

curly bracket:

replace

axioms of equality 等量公理

parentheses (小)括號

(老師們請注意:我們用加減消去法和代入消去法來解二元一次聯立方程式但是在英文教材，他們用 Elimination (消去消去法)和 Substitution(代入消去法)這兩個字。不過他們的 Elimination Method 就是用加法消去法，類似我們的加減消去法，如果需要式子相減，他們會將式子兩邊同乘上一個負數再將兩個式子相加)。

Please keep it in mind, we can solve any systems of linear equations by using either Elimination or Substitution method.

我們會提醒學生，所有的二元一次聯立方程式都可以使用加減消去法或者代入消去法來解

Because there are 2 variables in the system of equations, we need to eliminate one of the variables in order to get basic linear equations which students learned last semester

因為這裡的聯立方程式都有兩個未知數，所以我們必須要把其中一個未知數消去，得到學生在上學期學已經學過的解一元一次方程式

Solve the following system of linear equations by using Elimination Method

(以加減消去法解下列二元一次聯立方程式)

$\begin{cases} x + y = 5 \cdots (1) \\ x - y = -1 \cdots (2) \end{cases}$	<p>這個聯立方程式可以這樣說</p> <p>The first equation is x plus y equals 5</p> <p>the second equation is x minus y equals negative 1</p>
$\begin{cases} x + y = 5 \cdots (1) \\ x - y = -1 \cdots (2) \end{cases}$	<p>因為我們看到第一個式子有一個 +y，第二個式子有一個 -y</p> <p>Since we have positive y in equation (1) and we can see negative y in equation (2)</p>
$(x+y)+(x-y)=5+(-1)$ $x+x=4$	<p>我們要把兩個式子加起來，利用等量公理，左式加左式會等於右式加右式</p> <p>we only need to add up these 2 equations. According to the axioms of equality, the result of adding up the terms from the left of both equal signs will be equal to the result of adding up the terms from the right</p> <p>we cancel y</p>
$2x=4$	<p>Now we get 2 times x equals 4</p>
$x=2$	<p>divide 2 on both sides, x equals 2</p>

	求出 x 的值後我們要來求 y 的值 Now we need to find the value of y
$x+y=5\cdots\cdots(1)$ $2+y=5$	我們將 $x=2$ 代入第一式 we plug $x=2$ in either equation (1) or (2), let's choose equation (1), we get 2 plus y equals 5
$y=3$	subtract 2 from both sides, we get

So $x=2$, $y=3$ is the solution of this system of equations.
 We can also write in the form of ordered pair
 (x,y) is $(2,3)$

Solve the following system of linear equations by using Substitution Method

(以代入消去法解下列二元一次聯立方程式)

$$\begin{cases} x + y = 5 \cdots (1) \\ x - y = -1 \cdots (2) \end{cases}$$

$x - y = -1$	我們首先要讓一個未知數單獨留在等號的一邊 We first need to isolate one of the variables, let's choose x from equation (2) let me rewrite the equation (2)
$x = y - 1$	我們將 x 保留在等號的一邊 we want to isolate x, so we add y on both sides, then
$x + y = 5 \cdots (1)$ $(y - 1) + y = 5$	取代第一個式子的 x replace x in the top equation, we get
$2y - 1 = 5$	同類項合併 Combine the like terms
$2y = 6$	add 1 on both sides, We get
$y = 3$	then divide 2 on both sides, get
$x + y = 5 \cdots (1)$ $x + 3 = 5$	將 $y = 3$ 代入第一式 Replace y in equation (1)(or equation (2)) with 3
$x = 2$	subtract 3 from both sides, We get

So $x = 2$, $y = 3$ is the solution of the given system of equations