

EQUATIONS:

Lesson targets:

- (1). Complete the subtopic ✓
- (2). Assignment / Research ✓
- (3). Next stop ✓

Start ✓

(1). $3x = 18$

(3). $-3/4 y = 1$

(5). $\frac{1}{x} = \frac{2}{3}$

(2). $-2x + 3 = 0$

(4). $5 - 2x = 3$

(A). Linear equations {1 variable}.

(B). Linear equations (2 variables) ✓
↳ unknown ✓

(a). $\begin{cases} 2x + 3y = 1 \\ x - 5y = 7 \end{cases}$

→ Elimination ✓
→ Substitution ✓
→ Matrix {THR} ✓

Eliminate 1 unknown → How?
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(a). Elimination:

- ①. Choose the unknown ✓
②. Ensure that the unknown has the same coefficients in either equations ✓

③. Apply operations.

↳ SSS

{ Same | Sign | Subtract. }
↳ for the coefficients
↳ the eqns.

if NOT
We make them the same ✓

DSA opposite

(4). Magic ✓

Solution:

(1). $2x + 3y = 1 \longrightarrow (1)$
 $x - 5y = 7 \longrightarrow (2)$

$2 \times \text{Eqn (2)} \longrightarrow 2x - 10y = 14 \longrightarrow (3)$

$\text{Eqn (3)} - \text{Eqn (1)}$

$-13y = 13$

$y = -1$ ✓

Using (2) $\rightarrow x - 5(-1) = 7$

$$x = 2 \quad \checkmark$$

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∴ Solution Set is $\{2, -1\}$ ✓

Substitution → Label Eqns first ✓

Steps:
↳ (1). choose the eqn that looks simple ✓
(2). Choose one unknown that is easier to make the subject in the simple eqn

(3). Make it subject

Ensure that ✓
its on the LHS

↓ If Not
Put it there.

Make-sure
it stays
there alone.
on the LHS

Its Now
the
Subject

Label that
as eqn ③

substitute
for the
unknown in
the ignored eqn

✓
Magic.

$$\begin{array}{|l} 10x + 8y = 4 \\ 9x + 8y = 6 \end{array}$$

$$x = -2 \quad \checkmark$$

Using (4)

$$9(-2) + 8y = 6 \quad \checkmark$$

$$y = 3 \quad \checkmark$$

Using (3)

$$-2 - 2(3) - 2z = 0 \quad \checkmark$$

$$z = -4 \quad \checkmark$$

\therefore Solution set is $\{-2, 3, -4\} \quad \checkmark$

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$$(2). \quad x+z=1-2y \rightarrow x+2y+z=1 \rightarrow (1)$$
$$5z+y=3x-8 \rightarrow 3x-y-5z=8 \rightarrow (2)$$
$$2x+3y-z+1=0 \rightarrow 2x+3y-z=-1 \rightarrow (3)$$

$2 \times \text{Eqn (2)} + \text{Eqn (1)}$

$$7x-9z=17 \rightarrow (4)$$

$$3 \times \text{Eqn (2)} + \text{Eqn (3)}$$

$$11x-16z=23 \rightarrow (5)$$

$$11 \times \text{Eqn (4)} - 7 \times \text{Eqn (5)}$$

$$\begin{array}{r} 77x-99z=187 \\ - \quad 77x-112z=161 \\ \hline 13z=26 \\ z=2 \quad \checkmark \end{array}$$

$$\text{Using (5)} \rightarrow 11x-16(2)=23$$
$$x=5 \quad \checkmark$$

Using 1;

$$5+2y+2=1$$
$$y=-3 \quad \checkmark$$

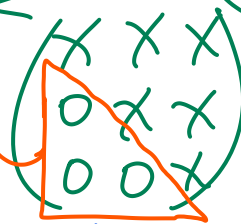
Matrix Operations

from **SCIENCE SCHOLARS ACADEMY | SSA**

→ Solving using Row Reduction to Echelon form. ✓

(1). $2x + 3y + z = 1$
 $3x - y - 3z = 3$
 $x - 2y - 2z = 0$

①. Produce
 triangle
 of zeros.



②. {upward
 substitution}

	x	y	z			x	y	z
R_1	2	3	1	1	$R_1' = R_1$	2	3	1
R_2	3	-1	-3	3	$R_2' = 3R_3 - R_2$	0	-5	1
R_3	1	-2	-2	0	$R_3' = R_2 - 3R_3$			
						$R_1'' = R_1'$		

“SSA | CREATING COMPETENT SCIENCE SCHOLARS IN UGANDA”