# Today's Learning Goal(s):

By the end of the class, I will be able to:

a) Solve a linear system using the method of elimination and check the answer.

MPM 2DI **1.4 Solve by Elimination** (Day 1) Date: Sept. 13/16

Concept

**Add the columns**

a) $2x$ / $3x$ → $5x$

b) $5y$ / $-2y$ → $3y$

c) $-4x$ / $4x$ → $0$

d) $-3y$ / $3y$ → $0$

e) $7x$ / $-7x$ → $0$

f) $-6x$ / $-6x$ → $-12x$

The Method of Elimination

1) Choose to eliminate "$x$" or "y" based on "opposites".
2) If an opposite does not exist you must create one by multiplying the whole equation by the correct number.
3) **ADD** each "column" of the two equations together.
4) Solve the new equation.
5) Substitute your first answer (variable) into the **original** equation ①.
6) Check your answers (both variables) in the **original** equation ②.

Ex. 1 Solve the system by elimination, and include a proper check.

$5x+2y=-1$ ①
$3x-2y=25$ ②

ELIM $y$

D+②

$8x+0=24$

$\frac{8x}{8}=\frac{24}{8}$

$x=3$

→ Sub in ①

$5(3)+2y=-1$

$15+2y=-1$

$2y=-1-15$

$\frac{2y}{2}=\frac{-16}{2}$

$y=-8$

Check $x=3, y=-8$ in ②

LS $=3x-2y$

$=3(3)-2(-8)$

$=9+16$

$=25$

RS $=25$

$\therefore$ LS $=$ RS

$\therefore (3,-8)$ is correct.

Ex. 2 Solve the system by elimination, and include a proper check.

$x-2y=-3$ ①

$x+6y=1$ ②

ELIM x

x(-1)

$-x-6y=-1$ ③

$x-2y=-3$ ①

$0-8y=-4$

$\frac{-8y}{-8}=\frac{-4}{-8}$

$y=\frac{1}{2}$

Sub in ①

$x-2\left(\frac{1}{2}\right)=-3$

$x-1=-3$

$x=-3+1$

$x=-2$

Check in ②

LS = x + 6y RS = 1

$=(-2)+3\left(\frac{1}{2}\right)$

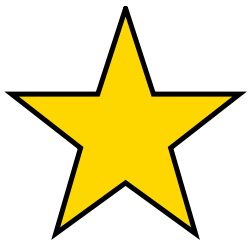
$=-2+3$

$=1$

∴ LS = RS

∴ $(-2, \frac{1}{2})$ is the correct answer.

$\left(-2, \frac{1}{2}\right)$



Ex. 3 Solve the system by elimination, and include a proper check.

$3x+2y=18$ ①

$x+5y=19$ ②

$\cdot 3 \times$ ② $-3x-15y=-57$ ③

$3x+2y=18$ ①

$-13y=-39$

$-13 \quad -13$

$y=3$

Sub in ①

$3x+2(3)=18$

$3x+6=18$

$3x=18-6$

$3x=12$

$x=4$

Check in ②

LS $= x+5y$ RS $=19$

$=(4)+5(3)$

$=4+15$

$=19$

$\therefore$ LS $=$ RS

$\therefore x=4, y=3$ is correct.

Today's eliminaon pracce:

p. 40 #1bd*, 2a, 4a (only show a check only for 1d)

p.448 #3c

*(Optional Elimination Challenge) p. 448 #3d*