WW set

3x3 systems

#4

(1) $4x + 5y + 12z = 5$

(2) $-x + 4y + 8z = -14$

(3) $-3x + y - 20z = -31$

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choose (1) + (2) + Kill x!

(1)	$4x + 5y + 12z = 5$
(2)	$-x + 4y + 8z = -14$
(1)	$4x + 5y + 12z = 5$
(4)=4(2)	$-4x + 16y + 32z = -56$
(5)=(1)+(4)	$21y + 44z = -51$ ~~x~~

$$\begin{array}{r} -14 \\ \times\ 4 \\ \hline -56 \end{array}$$

Now choose (2) + (3) MUST KILL The same variable! x!

(2)	$-x + 4y + 8z = -14$
(3)	$-3x + y - 20z = -31$
(6)=-3(2)	$3x - 12y - 24z = +42$
(3)	$-3x + y - 20z = -31$

$$\begin{array}{r} -14 \\ \times -3 \\ \hline +42 \end{array}$$

(7) = (6) + (3) | $x - 11y - 44z = +11$

Now solve the new system, 2 equations, only 2 variable's

(5) | $21y + 44z = -51$
(7) | $-11y - 44z = 11$

(8) = (5) + (7) | $10y = -40$

$$y = -4$$

Now substitute this into

(5) $21(-4) + 44z = -51$

$-84 + 44z = -51$

$+84 \qquad +84$

$$\begin{array}{r} 21 \\ \times -4 \\ \hline -84 \end{array} \qquad \begin{array}{r} 84 \\ -51 \\ \hline 33 \end{array}$$

$\frac{44z}{44} = \frac{33}{44}$

$$z = \frac{33}{44} = \frac{3}{4}$$

Now go back to (1), (2) or (3) to substitute y + z and solve for $\underline{\underline{x}}$!

(3) $-3x + y - 20z = -31$

$-3x - 4 - 20\left(\frac{3}{4}\right) = -31$

$-3x - \frac{16}{4} - \frac{60}{4} = -31$

$-3x - \frac{76}{4} = -31$

$4 \overline{)76}$ → 19

$-3x - 19 = -31$

$+19 \quad\quad +19$

$\frac{-3x}{-3} = \frac{-12}{-3}$

$x = +4$

$(4, -4, 3/4)$

Lesson 4 : 2/4

Exponent Rules:

$$x^m = \underbrace{x \cdot x \cdot x \cdots x}_{m\text{-times}}$$

$$x^{-m} = \frac{1}{x^m}$$

Ex $\frac{1}{x^2} = x^{-2}$

you can move powers "up" and "down" but must flip the sign of the exponent

Rules:

$$\left(\frac{x}{y}\right)^m = \frac{x^m}{y^m}$$

$$x^m \cdot x^n = x^{m+n}$$

$$\frac{x^m}{x^n} = x^{m-n}$$

Must have same base!

so $x^m \cdot y^n \neq xy^{m+n}$

not allowe dm

$$(x^m)^n = x^{m \cdot n}$$

$$\frac{x^m}{x^n} = x^m \cdot x^{-n} = x^{m-n}$$

Ex

a) $2^3 = 2 \cdot 2 \cdot 2 = 8$

b) $\left(\frac{1}{4}\right)^4 = \frac{1^4}{4^4} = \frac{1}{4 \cdot 4 \cdot 4 \cdot 4} = \frac{1}{256}$

$$\begin{array}{r} {}^{3}16 \\ \times\ 16 \\ \hline 96 \\ 160 \\ \hline 256 \end{array}$$

c) $4 \cdot 3^2 = 4 \cdot 9 = 36$

d) $x^2 \cdot x^3 = x^5$

e) $(-5)^7 \cdot (-5)^8 = (-5)^{15}$

f) $(-a^7 b^4)(3ab^9)$ multiply in any order we like

$= (-1 \cdot 3)(a^7 \cdot a^1)(b^4 \cdot b^9)$

$= -3a^8 b^{13}$

g) $\frac{2x^5 y^2}{xy} = 2 \cdot \frac{x^5}{x} \cdot \frac{y^2}{y} = 2x^4 y$

/

h) $\left(\frac{3xy^5}{6x^4}\right)^3 = \frac{(3xy^5)^3}{(6x^4)^3} = \frac{3^3x^3y^{15}}{6^3x^{12}}$

$= \frac{1\,y^{15}}{8\,x^9} = \boxed{\frac{1}{8} \cdot x^{-9}y^{15}}$