Abstract Algebra 7/29/19

$2x+y=3$
$x-y=4$

A system has a solution if:
- A pair of values for x & y that makes both equations true.
- The point where the two lines intersect.

these mean the same thing. How? Why?

The point of intersection is a pair of values that make both true.

Thinking Strategies: Graphing, Algebra tiles, Cup Stacking, Snap Cubes, Context, Pictures

$2\boxed{x}+\boxed{y}=3$
$\boxed{x}-\boxed{y}=4$

$\square\square\triangledown=3$
$\square=\triangledown 4$

$\triangledown+\triangledown+\triangledown+4+4=3$

He didn't have plus & minus symbols or times 2 coeficient or an understanding of negative #s.

Would do Substitution and Trade in each square for a triangle and a 4.

can't finish b/c he didn't know neg.

Why do the elimination rules work?

R_1 $x+2y+3z=7$ $\xrightarrow{\text{all x4}}$ $4x+8y+12z=28$
R_2 $2x-y-z=4$ $\xrightarrow{\text{same equ.}}$ $2x-y-z=4$
R_3 $3x+3y+z=2$ $\xrightarrow{\text{same equ.}}$ $3x+3y+z=2$

Same solution

R_1 $x+2y+3z=7$
R_2 $2x-y-z=4$
$2R_2+R_3$ $7x+y-z=10$

R_1 $2x+y=3$
$2R_1+R_2$ $5x+y=10$

$2R_1$ $4x+2y=6$
R_2 $(x-y)=(4)$

try graphing

using arbitrary a + b

R_1, R_2 $\xrightarrow{\text{mult}}$ R_1, bR_2 $\xrightarrow{\text{add}}$ R_1, aR_1+bR_2

R_2 w/ change done already

☆ done in two steps so we can see determinant changing

same as $x-y=4$

Why?
- mult all terms by 2 creates equivalent equ.
- adding equal expressions to both sides also creates equal equations.