Thursday, April 4, 2019

- Warm-up
  - Solve the following systems using any method

$$3d - 6p = 12$$
$$-d + 2p = -4$$

$$4x + 2y = 10$$
$$2x + y = 4$$

- How to check your work
- Application problems

Objectives

Content: I will write the **system of equations** to represent a situation, solve and check the solution and write in context.

Social: I will support my group members as they are processing content.

Language: I will read questions carefully looking for **categories of information** and **cues** for writing equations.

By Elimination

$$3d - 6p = 12$$
$$-d + 2p = -4 \quad (\times 3)$$

$$3d - 6p = 12$$
$$-3d + 6p = -12$$
$$0 = 0$$

infinite solutions
always true

$$4x + 2y = 10$$
$$2x + y = 4 \quad (\times -2)$$

$$4x + 2y = 10$$
$$-4x - 2y = -8$$
$$0 = 2$$

never true
no solutions

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By Substitution

3d - 6p = 12

-d + 2p = -4

$3d - 6p = 12$

$+6p \quad +6p$

$\frac{3d}{3} = \frac{12}{3} + \frac{6p}{3}$

$d = 4 + 2p$

$-d + 2p = -4$

$-2p \quad -2p$

$+d = +4 + 2p$

$d = 4 + 2p$

$4 + 2p = 4 + 2p$

$-2p \quad -2p$

$4 = 4$

always true = infinite solutions

4x + 2y = 10

2x + y = 4

$4x + 2y = 10$

$-4x \quad -4x$

$\frac{2y}{2} = \frac{10 - 4x}{2}$

$y = 5 - 2x$

$2x + y = 4$

$-2x \quad -2x$

$y = 4 - 2x$

$5 - 2x = 4 - 2x$

$+2x \quad +2x$

$5 = 4$

never true

no solutions

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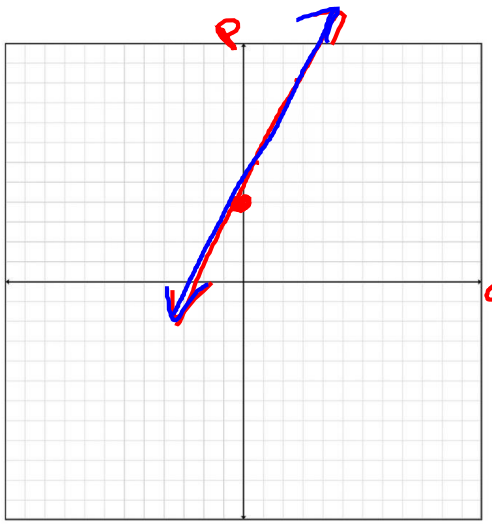
By Graphing

3d - 6p = 12

-d + 2p = -4



d = 4 + 2p

d = 4 + 2p

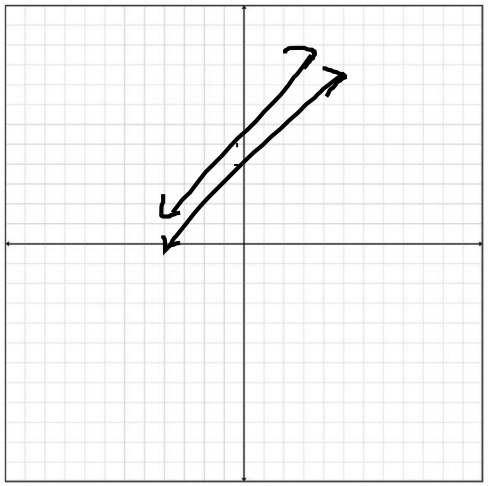
infinite solutions

Same line

SPECIAL CASES

4x + 2y = 10

2x + y = 4



Parallel

no solutions

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Checking your solution

$y = -2x - 3$

$-3 \quad -2x$

$-5x + y = -13$

$10x - 2y = 24$

$y = -2x - 3$

$x - y = -24$

$-x \qquad -x$

$-y = -24 - x$

$\frac{-y}{-1} = \frac{-24}{-1} - \frac{x}{-1}$

$y = 24 + x$

$-2x - 3 = 24 + x$

$-x \quad +3 \qquad +3 \quad -x$

$\frac{-3x}{-3} = \frac{27}{-3}$

$x = -9$

$y = 24 + -9$

$y = 15$

Check it → make sure it works in BOTH equations

$15 = -2(-9) - 3$

$15 = 18 - 3$

$15 = 15$ ✓

$-9 - 15 = -24$

$-24 = -24$ ✓

☺ it works!

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Brain Break

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elimination

Word Problems

Chase and Sara went to the candy store. Chase bought 5 pieces of fudge and 3 pieces of bubble gum for a total of $5.70. Sara bought 2 pieces of fudge and 10 pieces of bubble gum for a total of $3.60. How much is one piece of fudge? How much is one piece of bubble gum?

f b

Chase → $5f + 3b = 5.70$ $\times -2$ → $-10f - 6b = -11.4$

Sara → $2f + 10b = 3.60$ $\times 5$ → $10f + 50b = 18$

$44b = 6.6$

$\frac{44b}{44} = \frac{6.6}{44}$

$b = 0.15$

$f = 1.05$

$b = 0.15$

$2f + 10(0.15) = 3.60$

$2f + 1.50 = 3.6$

$-1.5 \quad -1.5$

$\frac{2f}{2} = \frac{2.1}{2}$

$f = 1.05$

$5(1.05) + 3(0.15) = 5.70$

$5.7 = 5.7$ ☺

$2(1.05) + 10(0.15) = 3.6$

$3.6 = 3.6$

fudge is $1.05 each, bubble gum is 0.15 each.

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Word Problems

A mixture of nickels and quarters totals $9.90. There is a total of 50 coins. How many are quarters and how many are nickels?

$50 = n + q$

$9.90 = 0.05n + 0.25q$

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Word Problems in the Round

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