

2.9. Honors Advanced Algebra

DATE: 9/3

$$\therefore \boxed{x=4}$$

Guided Notes Cont'd: Applications of Systems in 3 Variables

Problem 3 Solving a System Using Substitution

What is the x-value in the solution of the system?

First solve ② for x. Then substitute into ① and ③ for x.

$$\begin{cases} ① & 2x + 3y - 2z = -1 \\ ② & x + 5y = 9 \\ ③ & 4z - 5x = 4 \end{cases}$$

$$\begin{array}{r} x + 5y = 9 \\ -5y - 5y \\ \hline x = 9 - 5y \end{array}$$

$$\begin{aligned} ① & 2(9 - 5y) + 3y - 2z = -1 \\ & 18 - 10y + 3y - 2z = -1 \end{aligned}$$

$$\begin{array}{r} 18 - 7y - 2z = -1 \\ -18 \qquad \qquad -18 \\ \hline ④ \quad -7y - 2z = -19 \end{array}$$

$$\begin{aligned} ③ & 4z - 5x = 4 \\ & 4z - 5(9 - 5y) = 4 \\ & 4z - 45 + 25y = 4 \\ & \qquad +45 \qquad \qquad +45 \\ \hline ⑤ & 25y + 4z = 49 \end{aligned}$$

$$\begin{aligned} ② & (-7y - 2z = -19) \\ & 25y + 4z = 49 \\ \hline & -14y - 4z = -38 \\ & 25y + 4z = 49 \\ \hline & 11y = 11 \\ & \frac{11y}{11} = \frac{11}{11} \\ & y = 1 \end{aligned}$$

$$\begin{aligned} \text{So } x &= 9 - 5y \\ &= 9 - 5(1) \\ &= 4 \end{aligned}$$

Problem 4 Solving a Real-World Problem

2.9 Systems of 3 Variables - Day 2 - Word

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Arial 18 A⁺ A⁻ Aa A

B I U abc x₂ x² A ab A

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Business You manage a clothing store and budget \$6000 to restock 200 shirts. You can buy T-shirts for \$12 each, polo shirts for \$24 each, and rugby shirts for \$36 each. If you want to have twice as many rugby shirts as polo shirts, how many of each type of shirt should you buy?


Let x be # of T-shirts
 Let y be # of Polos
 Let z be # of rugby shirts

} set up system now!

① $x + y + z = 200$
 ② $12x + 24y + 36z = 6000$
 ③ $z = 2y$
 twice as many rugby shirts as polo shirts

Inspire to solve

Answer: You should buy 20 T-shirts, 60 polos, and 120 rugby shirts!



Got It?

You manage a clothing store and budget \$5400 to restock 200 shirts. You can buy T-shirts for \$12 each, polo shirts for \$24 each, and rugby shirts for \$36 each. If you want to have the same

PAGE 1 OF 3 19 WORDS 100%

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1.1 1.2 1.3 *Unsaved

$$\text{linSolve} \left\{ \begin{array}{l} x+y+z=200 \\ 12 \cdot x+24 \cdot y+36 \cdot z=6000 \\ z=2 \cdot y \end{array} \right\} \{x,y,z\}$$

{ 20,60,120 }

① calculator ② Menu ③ Algebra

④ Solve Linear Systems

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Page Size: Handheld 1.2 Settings Zoom: 200% Boldness: 100%

The screenshot shows the Microsoft Word 2013 interface. The title bar reads "2.9 Systems of 3 Variables -Day 2 - Word". The ribbon is set to the "HOME" tab, with the "Styles" group expanded to show the "Normal" style selected. The main document area contains the following text:

Got It?

You manage a clothing store and budget \$5400 to restock 200 shirts. You can buy T-shirts for \$12 each, polo shirts for \$24 each, and rugby shirts for \$36 each. If you want to have the same number of T- shirts as polo shirts, how many of each type of shirt should you buy?

You try it!

The status bar at the bottom indicates "PAGE 1 OF 3", "19 WORDS", and a zoom level of "100%".

2.9 Systems of 3 Variables - Day 2 - Word

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B I U abc x₂ x² A ab A

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Sports A stadium has 49,000 seats. Seats sell for \$25 in Section A, \$20 in Section B, and \$15 in Section C. The number of seats in Section A equals the total number of seats in Sections B and C. Suppose the stadium takes in \$1,052,000 from each sold-out event. How many seats does each section hold?

Let x be # of seats in Section A

Let y be # of seats in Section B

Let z be # of seats in section C

① $x + y + z = 49,000$

② $25x + 20y + 15z = 1,052,000$

③ $x = y + z$

} inspire

Section A has 24,500 seats, section B 14,400 seats,
and section C 10,100 seats ✓

PAGE 2 OF 3 19 WORDS 100%

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TEXAS INSTRUMENTS

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minSolve $\left\{ \begin{array}{l} x+y+z=49000 \\ 25 \cdot x+20 \cdot y+15 \cdot z=1052000 \\ x=y+z \end{array} \right. , \{x,y,z\}$

$\{24500, 14400, 10100\}$

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