Your Name

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Notes

Lesson 5.3

Solving Systems of Equations Using Elimination

Pg. 248-252

Objective: To be able to determine the solution types of a system of equations as well as what the solutions are using elimination.

Life Lesson: If a solution works for you and it works for some one else then it works for both of you and is THE solution to your problem.

Skill: This method is why standard form is really important.

Many real world problems can be solved by a system of equations and if you are good at them then you can bust it out to easily find the solution. The more variables that you must solve for the more equations you need to solve them with, and they can be linear, quadratic, cubic, or anything.

The ELIMINATOR!!!!!

Gettin rid of variables left and right

Finding the solution using Elimination

*Use when one variable has the same coefficients in both equations but one is added and one is subtracted

Step 1: Put both equations in standard form $Ax+By=C$

Step 2: Add the equations together (x's with x's and y's with y's and constants with constants) This will eliminate a variable leaving only one variable left in an equation

Step 3: Solve for the variable that is left

Step 4: Substitute the solved variable in to one of the original equations to solve for the other.

Step 5: Write the solution as an ordered pair coordinate point (x,y)

1 2
+ 3

ex. $x + y = -4$ ✓ Step 1

$+\ x - y = 2$ ✓ Step 2

$2x + 0y = -2$

Step 3: $\frac{2x}{2} = \frac{-2}{2}$

$x = -1$

Step 4: $x + y = -4$

$(-1) + y = -4$

$-1 + y = -4$

$+1 \quad +1$

$y = -3$

Step 5: $(-1, -3)$

ex. $2m - 3n = 14$ ✓

$+\ m + 3n = -11$ ✓ Step 2

Step 3: $\frac{3m}{3} = \frac{3}{3}$

$m = 1$

$2(1) - 3n = 14$

$2 - 3n = 14$

$-2 \quad -2$

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

$n = -4$

$(1, -4)$

$-3x - 4y = 1$

$+\ 3x - y = 4$

Step 2

$-5y = 5$

$\frac{-5y}{-5} = \frac{5}{-5}$

Step 3

$y = -1$

$3x - y = 4$ Step 4

$3x - (-1) = 4$

$3x + 1 = 4$

$-1 \quad -1$

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

$x = 1$

$(1, -1)$ Step 5

$3c + d = 4$

$2c - d = 6$

(c, d)

$(2, -2)$

$-0.2x + y = 0.5$

$0.2x + 2y = 1.6$

Step 2

Step 3

$\frac{3y}{3} = \frac{2.1}{3}$

$y = .7$

Step 4

$0.2x + 2(.7) = 1.6$

$0.2x + 1.4 = 1.6$

$-1.4 \quad -1.4$

$\frac{0.2x}{0.2} = \frac{0.2}{0.2}$

$x = 1$

Step 5

$(1, 0.7)$

Coefficents the same and same sign

Sometimes the numbers in front are the same and when you add, no terms get eliminated.

When this happens multiply one of the equations by -1 so that ALL the signs change, and now when you add them they will cancel.

$3x - 4y = -1$

$(3x - y = -4)(-1)$ Step 1

$3x - 4y = -1$

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

$\frac{-3y}{-3} = \frac{3}{-3}$

$y = -1$ Step 3

$3x - 4y = -1$ Step 4

$3x - 4(-1) = -1$

$3x + 4 = -1$

$-4 \quad -4$

$\frac{3x}{3} = \frac{-5}{3}$

$x = -\frac{5}{3}$

$\left(-\frac{5}{3}, -1\right)$ Step 5

Summary

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Virtue: If a solution works for you and it works for some one else then it works for both of you and is THE solution to your problem.

Skill: This method is why standard form is really important.

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Assignment: Workbooks 5-3

pg. 251

#3,4,5,7,9, and:

$3x + 4y = 19$ and $3x + 6y = 33$

Homework Answers pg. 251:

3. (1,6) 4. (-3,29) 5. (4,5)

7. (-1,2) 9.(0, -10)

$3x + 4y = 19$

$3x + 6y = 33$

(-3,7)