5.2

SOLVING SYSTEMS OF LINEAR EQUATIONS BY SUBSTITUTION

Do Now

Simplify.

1) $4x+7+5x-2$

2) $5+4z-2z$

3) $5(c+8)+c+3$

Do Now

Solve.

4) $4x-2(3x+1)=16$

5) $-3(z-8)+10=-5$

Review: Systems of equations

A system of equations is when you have two or more equations with the same variables.

$$2x-y=8$$
$$x+y=1$$

Solving systems of equations means: find x and y that will fit into both equations at the same time.

In this case, the solution that will fit for this is (3,-2)

Example 1

Solve for the missing variable by substituting the number for the variable:

a) $2x+3y=13$, $x=2$

b) $y=14$, $y=2x-2$

Example 2

Use substitution to solve the system. Then check your solution algebraically.

a) $y=2x$, $4x+y=12$

b) $x=2y+1$, $3x+2y=19$

Example 3

Solve the linear system by substitution. Check your solution.

First, you must _____in one equation.

$-x+y=3$

$x+2y=-6$

Now you try...

1) $y=2x+5$, $3x+y=10$

2) $-3x+y=-7$, $2x+4y=0$

5.2

SOLVING SYSTEMS OF LINEAR EQUATIONS BY SUBSTITUTION (WORD PROBLEMS)

Writing equations - Revisit

Write the following as equations in standard form.

1) **Your class is taking a trip to a science museum. You can travel in small and large vans. A small van holds 8 people, and a large van holds 12 people. There will be 144 people on the trip.**

2) **People at a banquet will be seated at rectangular and round tables. Rectangular tables seat 6 people, and round tables seat 10 people. There will be 120 people in the banquet.**

3) **You spend \$80 on *c* CD's that cost \$15 each and *d* DVDs that cost \$20 each.**

Writing System of Linear Equations

Define your variables <u>and</u> then write the following as two equations.

1) **The sum of two numbers x and y is 35. The value of x is 4 times the value of y.**

2) **The difference between two numbers y and x is 12. The value of y is 5 times the value of x.**

Writing System of Linear Equations

Define your variables <u>and</u> then write the following as two equations.

3) **You have twice as many apples as oranges, and you have 12 apples and oranges altogether.**

4) **You have a total of 5 coins. Some are nickels and some are dimes. The total value of is 40 cents**

Writing System of Linear Equations

Define your variables and then write the following as two equations.

5) The sum of two numbers is 10. The bigger number is 1 more than twice the smaller number.

6) Five bagels and 4 donuts cost $7 altogether. A donut costs $0.40 more than a bagel.

Solving Systems of Linear Equations

Define your variables, write the following as two equations, and then solve.

1) You buy a shirt and a hat for $28. The shirt costs $2 more than the other.

Solving Systems of Linear Equations

Define your variables, write the following as two equations, and then solve.

2) The sum of two numbers is 14. Their difference is 10.

Solving Systems of Linear Equations

Define your variables, write the following as two equations, and then solve.

3) You buy 2 sandwiches for $8. One sandwich costs 3 times as much as the other sandwich. How much was each sandwich?

Solving Systems of Linear Equations

Define your variables, write the following as two equations, and then solve.

4) Jack has twice as much money as Jill. If they have altogether $36. How much does each have?