Solving Systems by Substitution

A ganda Warm-Up HW Check
Notes p. 78
Summarize p. 79
HW \#1-11, omit \#3, 4, and 7

Reminders
HW 4. 2 DUE TM -
don't forget the last page
Essential Question
How do I find a
solution to a system
using substitution?

Warm-Up - Thursday

1. Given $x-2 y=4$ and $x=1$, what is the value of $y$ ?

$$
\begin{aligned}
& x-2 y=4 \\
& -2 y=-3
\end{aligned}
$$

2. What does the word

$$
y=\frac{-3}{2}
$$ substitute mean to you?

replace

Algebra I - Unit 6: Topic 1 - Intro to Systems
Practice - Writing Systems of Equations No textbook correlation
Name Wre
Name
Write the Let Statements and derive a system of equations that could be used to solve each problem.

1. The admission fee at a small fair is $\$ 1.50$ for children and $\$ 4.00$ for adults. On certain day, 2200 people enter the fair and $\$ 5050$ is collected. How many children and how many adults attended?
Let Statements

2. The treasurer of the student body at a college reported that the receipts from a recent concert totaled $\$ 916$. Furthermore, he announced that 560 people had attended the concert. Students were charged $\$ 1.25$ each for admission to the concert, and adults were charged $\$ 2.25$ each. How many adults attended the concert?

3. Elle went to Pet Smart and bought 4 goldfish and 3 turtles for $\$ 28$. Later that day, Warren went to Pet Smart and bought 6 goldfish and 1 turtle for $\$ 10$. How much does 1 goldfish cost?

Let Statements
$\square$
4. The perimeter of a rectangle is 40 . The width is four less than 5 times the length. Find the dimensions of the rectangle.

Let Statements $\square$
5. The school track team earned $\$ 2$ for every hat they sold and $\$ 5$ for every sweatshirt they sold. The total profits were \$317. If they sold 1 more of the hats than of the sweatshirts, which system could be used to find how many sweatshirts they sold?
Let Statements

6. A boy has seven more nickels than quarters. The total value of the coins is $\$ 4.90$. Which system could be used to find how many nickels and quarters he has?
A $\quad \begin{aligned} & n=7+q \\ & 0.05 n+0.25 q\end{aligned}=4.90$
B. $n+q=4.90$
$q=7+n$
c. $0.05 n+0.25 q=4.90$
D. $\begin{aligned} & n=7+q \\ & n+q=4.90\end{aligned}$

Solving with Substitution p. 78
Essential question How do I find a solution to a system using substitution? Solve each system of equations.

$$
\text { 1. } \begin{array}{r}
4 x-3 y=24 \\
\left.y=\frac{(3 x-10)}{x}\right) \\
4 x-3(2 x-10)=24 \\
4 x-6 x+30=24 \\
-2 x+30=24 \\
-30-30 \\
\frac{-2 x}{-2}=\frac{-6}{-2} \\
x=3
\end{array}
$$

Find eq
solved fora
variable ( $y=$ )
(2) Substitute into
other equation
(4) Plug in.

$$
\begin{gathered}
x+2 x=6 \\
\frac{3 x}{3}=\frac{6}{3} \\
x=2 \\
y=2(2) \\
y=4
\end{gathered}
$$

Solving with Substitution p. 78
Essential Question How do I find a solution to a system using substitution?
Solve each system of equations. Answers should be written as an ordered pair.
3. $y=2 x+5$ parenthesis

$$
3 x-y=10
$$

4

$$
3 x-(2 x+5)=10
$$

$$
3 x-2 x-5=10
$$

$$
\begin{aligned}
& x-p=10 \\
& x+5+5
\end{aligned}
$$

$$
+p_{5}+5
$$

$$
x=15
$$

$$
y=2(15)+5
$$

$$
y=35
$$

$$
\text { 4. } \begin{gathered}
2 y+2 x=4 \\
x+y=3 \\
-x=-x \\
y=3-x \\
2(3-x)+2 x=4 \\
6-2 x+\frac{2 x x}{6}=4 \\
6=4 \\
\text { sot true }
\end{gathered}
$$



## Solving with Substitution p. 78

Essential question How do I find a solution to a system using substitution?
4/8 Given the equations (RANBAChand $x+2 y=-7$,
what would you substitute for $x$ in the equation
$2 x-3 y=0$ ?
A $-7+2 y$
B $7-2 y$
$\frac{\text { \& }-\frac{7}{2} y}{\text { D }-7-2 y}$
Solve for $x$

$$
\begin{array}{r}
x+2 y=-7 \\
-2 y=-2 y \\
x=-7-2 y
\end{array}
$$

8 A jar contains nickels and dimes. Thereare 20 coins in the jar, and the total value of the coins is

$$
n+d=20
$$

$\$ 1.40$. Write a system of equations to determine how many nickels and how many dimes are in the jar.


On the next page in your notebook (p.79), write or draw out the steps to solve a system by substitution. Your steps should include an example and $\mathrm{CO} O \mathrm{OR}$.

If you need an example...

$$
y-x=2
$$

$$
-3 x+4 y=11
$$

| SOLVE FOR A |  |
| :---: | :--- |
| VARIABLE |  |
| SUBSTITUTE INTO 2ND <br>  <br> SOLVE |  |
| SUBSTITUTE IN 1ST |  |
| EQUATION \& |  |
| SOLVE |  |
| CHEOK YOUR |  |
| SOLUTION! |  |

 Algebra I - Unit 6: Topic 2 - Solving Systems by Substitution Practice - Solving Systems by Substitution pp 390-396
Name $\qquad$

## Find the solution for each system of linear equations.

1. $\begin{aligned} & y=2 x \\ & x+y=12\end{aligned}$
2. $\begin{array}{r}y=2 x-5 \\ 4 x+y=7\end{array}$
"OMITG
"GM14
3. The equations of two lines are $2 x-3 y=12$ and $x=4 y+1$. What is the value of $x$ in the solution for this system of equations?

Find the solution for each system of linear equations.
6. $\begin{aligned} 4 y+x & =5 \\ x+4 y & =10\end{aligned}$
'OMHT"..."

Algebra I - Unit 6: Topic 2 - Solving Systems by Substitution Find the solution for each system of linear equations.
8. Tyler is six years older than his sister, and the sum of their ages is 32 . How old is Tyler? How old is his sister?


Answer (complete sentence):
9. What mistake was made in solving the following system of equations?
$\begin{aligned} & -3 x+y=-4 \\ & 3 y=15 x+6\end{aligned} \longrightarrow y=3 x-4$
Step 1: $3(3 x-4)=15 x+6$
Step 2: $9 x-12=15 x+6$
Step 3: $6=24 x$
Step 4: $\frac{1}{4}=x$
A Did not solve for $y$ correctly
B Did not distribute correctly in Step 1
C Should have subtracted $9 x$ from $15 x$ in Step 2
D No mistake was made
10. At the Cinema Snakshak, one customer bought 3 large popcorn buckets and 2 small drinks for a total of $\$ 21.00$. At the Cinema Snakshak, one customer bought 3 large popcorn buckets and 2 small drinks for a total of $\$ 21.00$.
Another customer bought one large popcorn bucket and 4 small drinks for a total of $\$ 17.00$. Find the cost of a large popcorn.

Let Statements


$$
\begin{gathered}
\text { Answer: } \\
\text { (in a complete sentence) }
\end{gathered}
$$

11. Given the equations $y-3 x=8$ and $3 x=2 y+7$, what would you substitute for $y$ in the equation $3 x=2 y+7$ ?

A $8-3 x$
B $\frac{8}{3} x$
C $8+3 x$
D $8 \cdot 3 x$

## Solving with Substitution HW Help

Essential Question How do I find a solution to a system using substitution?

1. $(3,6)$. Substitute $2 x$ for $y$ in the 2 nd equation.
2. $(2,-1)$ Substitute $(2 x-5)$ for $y$ in the 2 nd equation
3. OMIT 4. OMIT
4. $x=5$. Substitute $(4 y+1)$ for $x$ in the first equation.
5. Solve one equation for $x$. Substitute $x$ into the other equation. What happens to the $y$ 's? Do you get a true statement?
6. OMIT
7. Let Tyler's age be $x$ and let his sister's age be $y$. Your system should be $x=6+y$ and $x+y=32$. Replace $x$ in the 2nd equation with $(6+y)$. Make sure your answer makes sense!
8. C
9. A large popcorn costs $\$ 5$. Make sure you show your process.
10. ADD $3 x$ to both sides.
