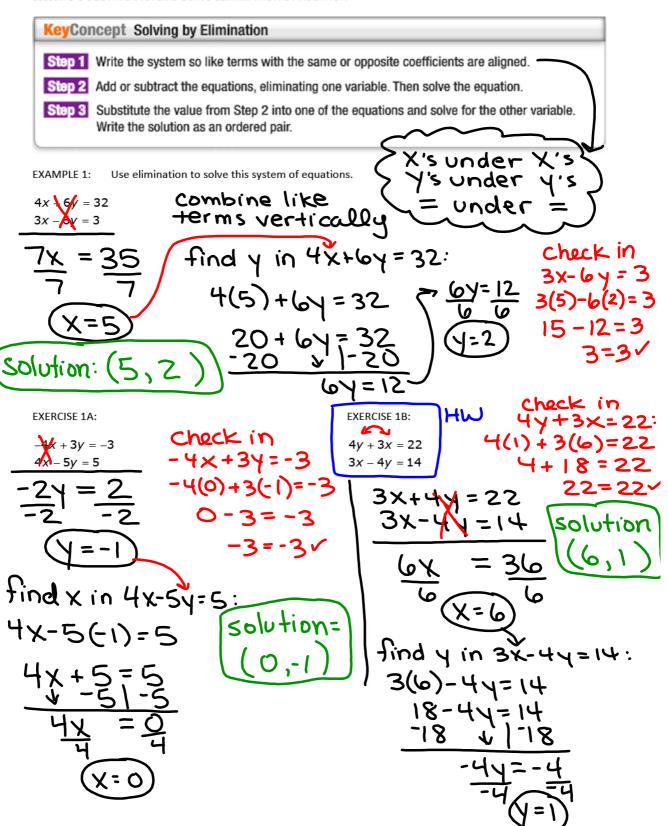
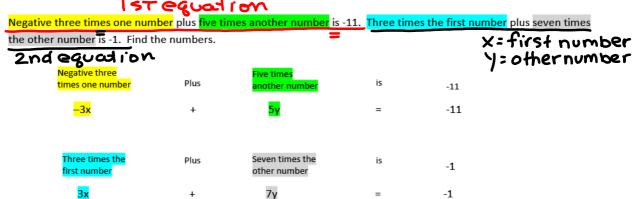
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Lesson 5-3 SOLVING SYSTEMS USING ELIMINATION BY ADDITION



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Example 2: Write and solve a system of equations



Add the system to eliminate a variable:

$$3x + 5y = -11$$

$$(+) 3x + 7y = -1$$

$$12y = -12$$

$$12$$

$$y = -1$$
Solve for y
$$y = -1$$

Replace (-1) into an original equation for "y" and solve for "x"

$$-3x + 5y = -11$$
 Top equation
 $-3x + 5(-1) = -11$ → Solve for x
 $-3x - 5 = -11$
 $+5 + 5$
 $-3x = -6$
 -3 -3

Are: X's under X's ? Y's under y's? - under = ? -> If yes to all 3, does anything cancel out?

(Y,X)

x = 2

Write your answer as an Ordered Pair (2, -1) What does your answer mean? The first

number was 2 and the other number was -1.

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EXERCISE 2:

2nd equation

The sum of two numbers is -10. Negative three times the first number minus the second number equals 2. Find the

numbers. (Hint: let x = the 1st number and y = the 2nd number) Now write the system:

$$\begin{array}{r}
|X+Y|=-10 \\
-3X-Y=2
\end{array}$$

$$\begin{array}{r}
2 \text{ nd equation} \\
-2X = -8 \\
-2
\end{array}$$
Solve for x
$$\begin{array}{r}
X=4
\end{array}$$

check (n-3x-y=2)

-3(4)-(-14)=2-12+14 = 2 2=2 \int Solution is (4,-14) The first number was 4 and the second number was -14.

EXERCISE 3: Solve the system **algebraically** for x and y.

3x
$$4y = 12$$
 $3x + 4y = 12$
 $3x + 4$

check in 2x-y=3: 2(3)-3=33=3~

The numbers are 3 and 3.