6-3 Elimination using Addition and Subtraction

Adding or Subtracting a system of equations so that one variable will be **eliminated** therefore you can solve for the remaining variable. Finally, you will use this variable and **substitute** it back into an equation from the **system** to solve for the remaining variable.

Steps:
1. Write the system so like terms with the same or opposite coefficients are aligned.
2. Add or subtract the equations, eliminating one variable. Then solve for the equation.
3. Substitute the value from the equation you solved (step 2) into one of the equations and solve for the other variable.
4. Write the solution as an ordered pair: (x,y)

$$\begin{array}{r} 4x + 6y = 32 \\ +\ 3x - 6y = 3 \\ \hline 7x + 0 = 35 \end{array}$$

$7x = 35$

$x = 5$

$4(5) + 6y = 32$

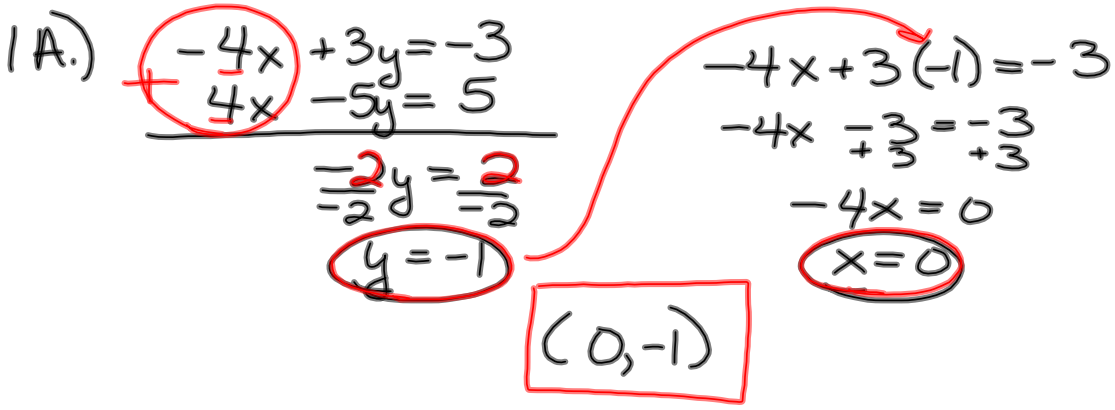
$20 + 6y = 32$

$-20 \quad -20$

$6y = 12$

$y = 2$

$(5, 2)$


1A.)
−4x + 3y = −3
+ 4x − 5y = 5
−2y = 2
−2 −2
y = −1
−4x + 3(−1) = −3
−4x − 3 = −3
+3 +3
−4x = 0
x = 0
(0, −1)

1B.)

$$+4y + 3x = 22$$
$$3x - 4y = 14$$
$$-4y + 3x = 14$$

Rewrite the system rearranging the terms

$$4y + 3x = 22$$
$$+\ -4y + 3x = 14$$
$$6x = 36$$
$$x = 6$$

$$4y + 3(6) = 22$$
$$4y + 18 = 22$$
$$-18 \quad -18$$
$$4y = 4$$
$$y = 1$$

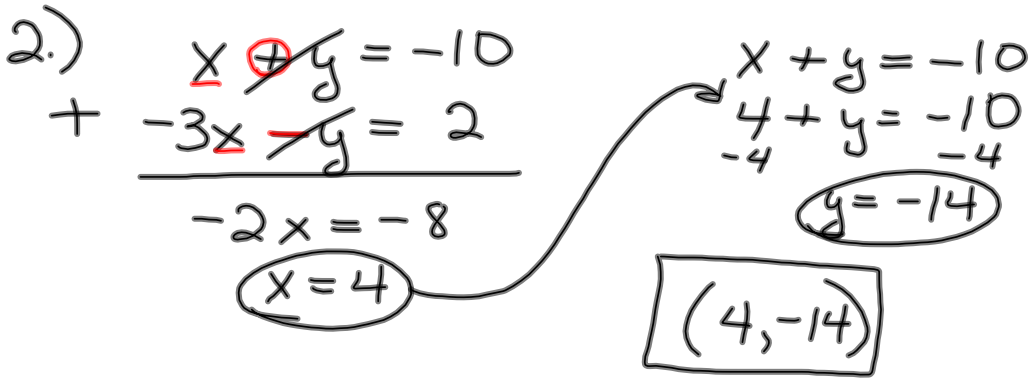
$(6, 1)$

Ex 2:

$$\begin{array}{r} -3x + 5y = -11 \\ +\ 3x + 7y = -1 \\ \hline 12y = -12 \\ \frac{12}{12}y = \frac{-12}{12} \\ y = -1 \end{array}$$

$$\begin{array}{r} -3x + 5(-1) = -11 \\ -3x - 5 = -11 \\ +5 \quad +5 \\ \hline -3x = -6 \\ \frac{-3}{-3}x = \frac{-6}{-3} \\ x = 2 \end{array}$$

$(2, -1)$


2.)
x + y = −10
+ −3x − y = 2
−2x = −8
x = 4
x + y = −10
4 + y = −10
−4 −4
y = −14
(4, −14)

p.353 Subtraction

$2t + 5r = 6$
$+\ 9r + 2t = 22$

$+2t + 5r = 6$
$+2t + 9r = 22$ (-1)
$-2t - 9r = -22$

$2t + 5r = 6$
$(-2t + 9r = 22)$
$-2t - 9r - 22$

(4, 7)

$+\ \cancel{2t} + 5r = 6$
$\quad \cancel{-2t} - 9r = -22$
$-4r = -16$
$-4 \quad -4$
$r = +4$

$2t + 5(4) = 6$
$2t + 20 = 6$
$-20 \quad -20$
$2t = 14$
$t = 7$

3.) $8b+3c=11$

$(-1)\ 8b+7c=7\ (-1)$

$-8b-7c=-7$

Rewrite:

$8b+3c=11$

$+\ -8b-7c=-7$

opposite coefficients = add

$-4c=4$

$c=-1$

$8b+3(-1)=11$

$8b-3=11$

$+3\ \ +3$

$8b=14$

$b=1.75$

$(1.75, -1)$ (b, c) (x, y)

G

4.) $a + t = 47$

$a - 5 = t$

$a - t = 5$

$1a + 1t = 47$

$+ \quad 1a - 1t = 5$

$2a = 52$

$a = 26$

a = Adelina

t = Tamera

Adelina = 26 guests

$26 + t = 47$

$-26 \quad -26$

$t = 21$ guests

(26, 21)

Assignment

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guided pra 5 prob
+ 5 prob
10 prob.