Warm Up Questions

1. A local farm has 15 animals consisting of cows and chickens. Determine the number of each if there are 40 legs on the farm.

Let x = # of cows

Let y = # of chickens

$x+y=15$

$4x+2y=40$

Solve for x →

(i) $x=-y+15$

(ii) $4x+2y=40$

$4(-y+15)+2y=40$

$-4y+60+2y=40$

$-4y+2y=40-60$

$\frac{-2y}{-2}=\frac{-20}{-2}$

$y=10$

(iii) $x+y=15$

$x+10=15$

$x=15-10$

$x=5$

(iv) 5 cows + 10 chickens

2. The next JMH play is called "The Love of Math". The tickets are $5 for students and $10 for adults. People are so excited that 261 tickets were sold in advance. How many student and adult tickets were sold if the total amount collected was $ 1840.

Let x = # of students

Let y = # of adults

$x + y = 261$

$5x + 10y = 1840$

solve for x

(i) $x = -y + 261$

(ii) $5x + 10y = 1840$

$5(-y + 261) + 10y = 1840$

$-5y + 1305 + 10y = 1840$

$-5y + 10y = 1840 - 1305$

$\frac{5y}{5} = \frac{535}{5}$

$y = 107$

(iii) $x + y = 261$

$x + 107 = 261$

$x = 261 - 107$

$x = 154$

(iv) 154 students and 107 adults

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

Let x = # of children

Let y = # of adults

$x + y = 2200$

$1.5x + 4y = 5050$

Solve for x

(i) $x = -y + 2200$

(ii) $1.5x + 4y = 5050$

$1.5(-y + 2200) + 4y = 5050$

$-1.5y + 3300 + 4y = 5050$

$-1.5y + 4y = 5050 - 3300$

$\frac{2.5y}{2.5} = \frac{1750}{2.5}$

$y = 700$

(iii) $x + y = 2200$

$x + 700 = 2200$

$x = 2200 - 700$

$x = 1500$

(iv) 1500 children and 700 adults

4. **Nigel has $6000 to invest. His bank offers an interest rate of 9% on an ABC investment and 11% on the GTA investment. If he makes $572 in interest, how much did he invest in each one?**

Let x = investment in ABC $9\% = \frac{9}{100} = 0.09$

Let y = investment in GTA $11\% = \frac{11}{100} = 0.11$

$x + y = 6000$ → Solve for x → (i) $x = -y + 6000$

$0.09x + 0.11y = 572$ (ii)

(i) $x = -y + 6000$ (iii)

(ii) $0.09x + 0.11y = 572$

$0.09(-y + 6000) + 0.11y = 572$

$-0.09y + 540 + 0.11y = 572$

$-0.09y + 0.11y = 572 - 540$

$\frac{0.02y}{0.02} = \frac{32}{0.02}$

$y = \$1600$

(iii) $x + y = 6000$

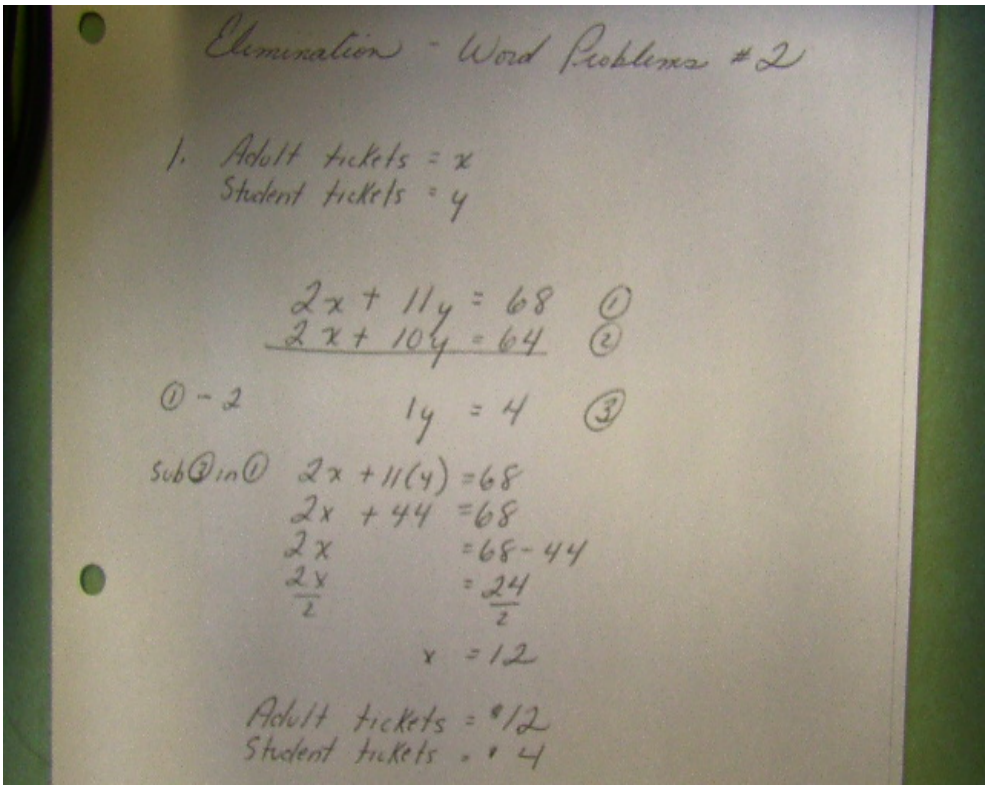
$x + 1600 = 6000$

$x = 6000 - 1600$

$x = \$4400$

(iv) $4400 in ABC and $1600 in GTA

Homework



Elimination - Word Problems #2

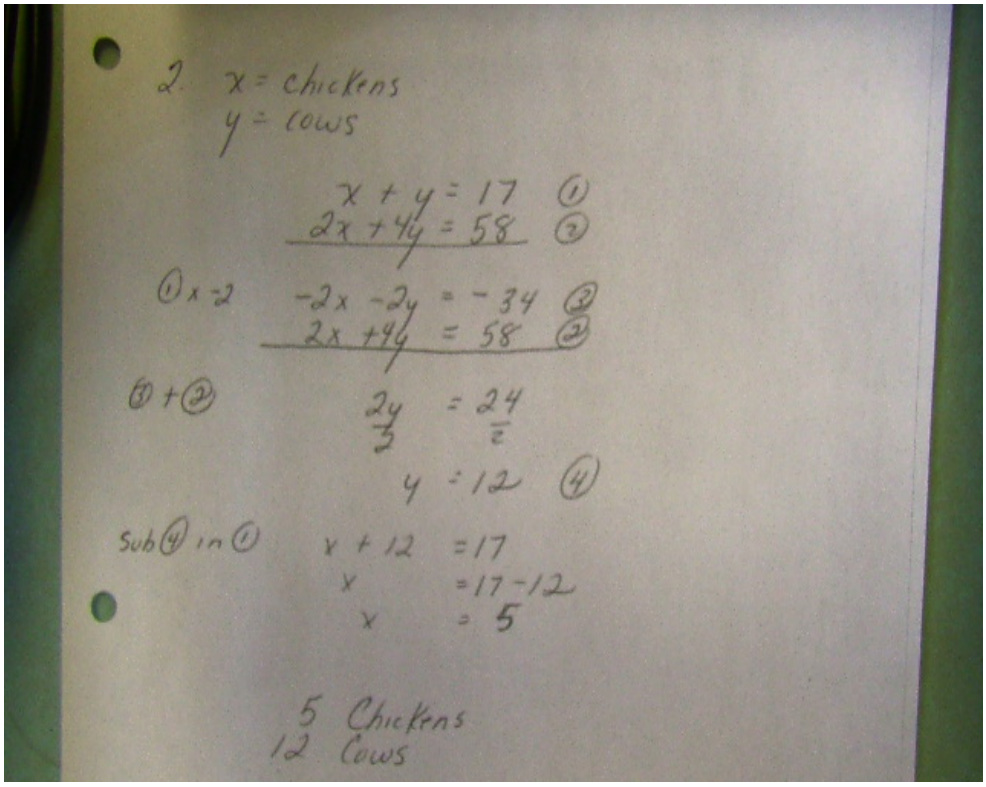
1. Adult tickets = x
Student tickets = y

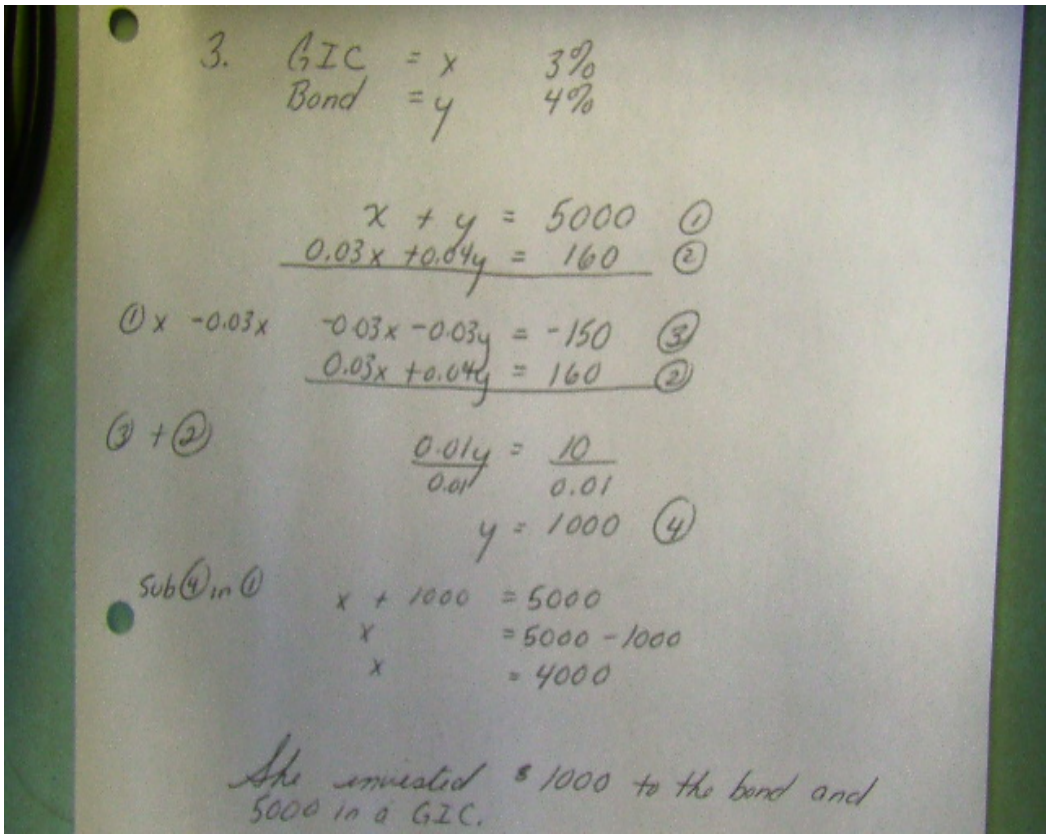
$2x + 11y = 68$ ①
$2x + 10y = 64$ ②

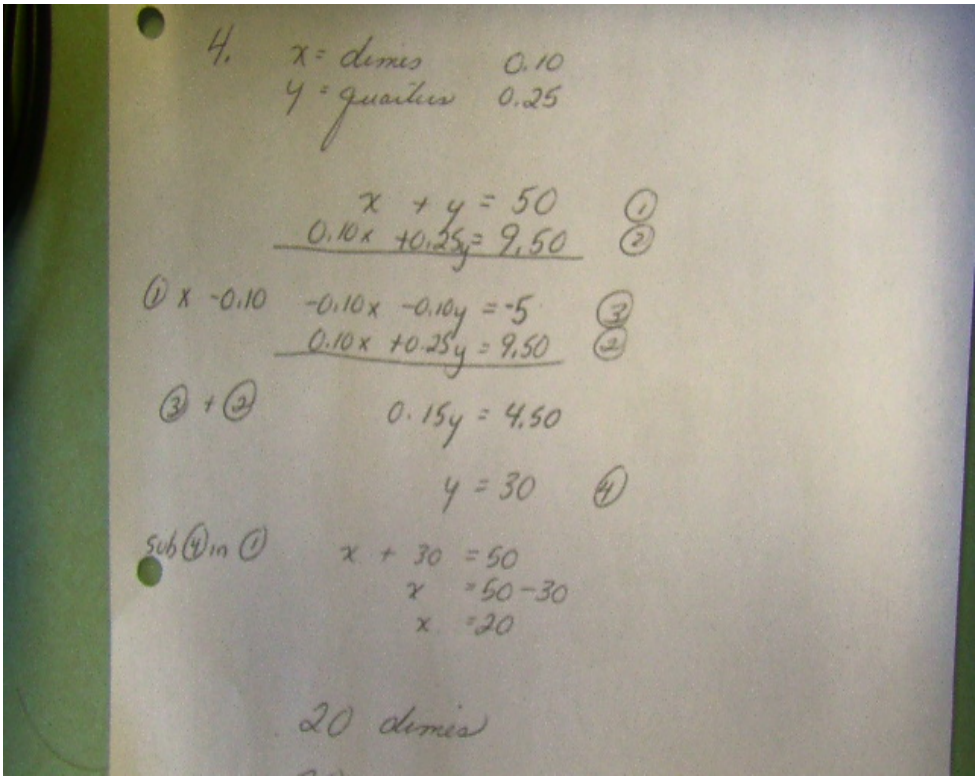
① − ② $\quad 1y = 4$ ③

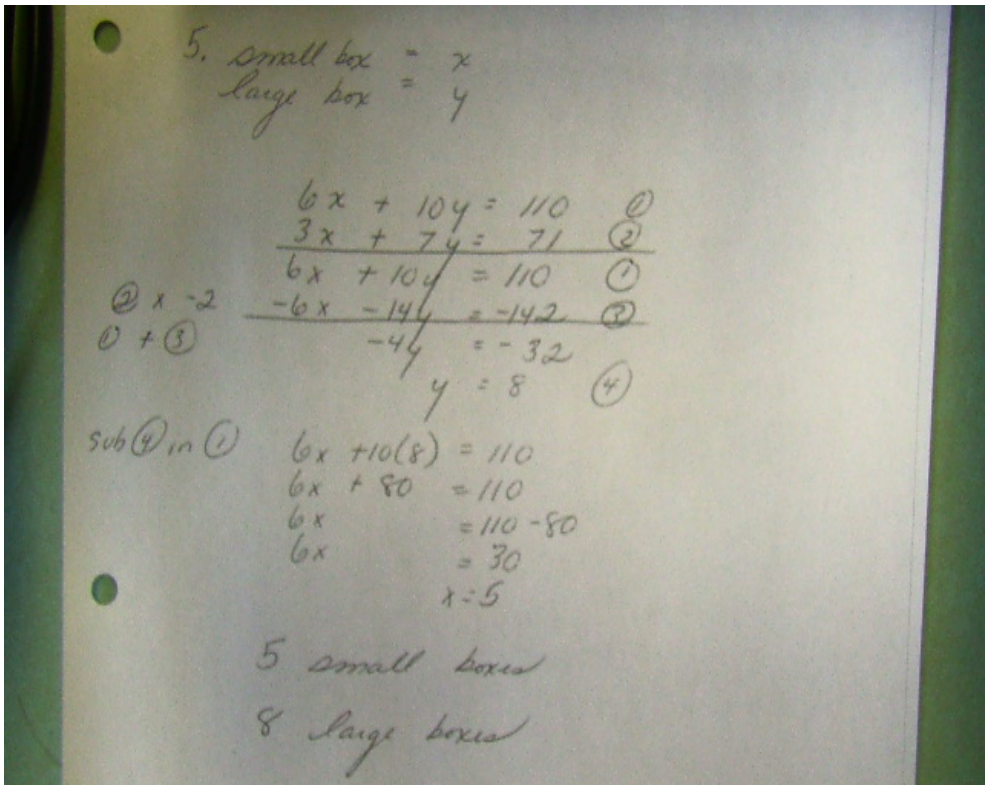
Sub ③ in ① $\quad 2x + 11(4) = 68$
$2x + 44 = 68$
$2x = 68 - 44$
$\frac{2x}{2} = \frac{24}{2}$
$x = 12$

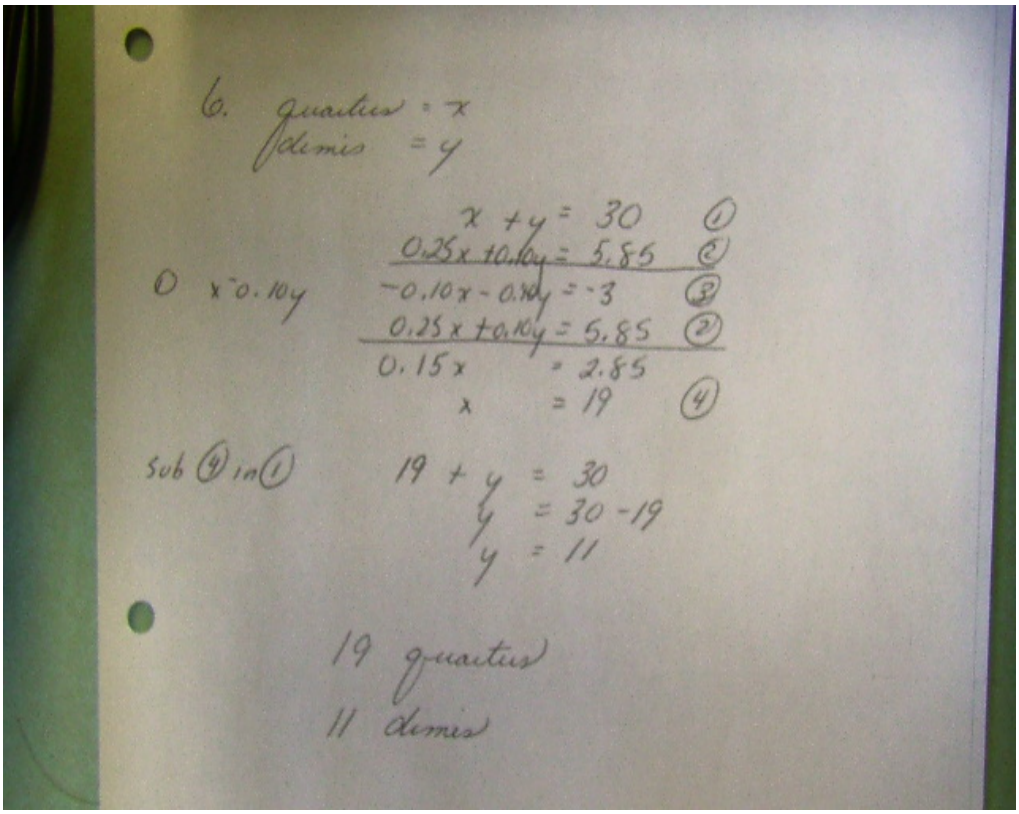
Adult tickets = $12
Student tickets = $4


2. x = chickens
y = cows
x + y = 17 ①
2x + 4y = 58 ②
① x -2
-2x - 2y = -34 ③
2x + 4y = 58 ②
③ + ②
2y = 24
2 2
y = 12 ④
Sub ④ in ①
x + 12 = 17
x = 17 - 12
x = 5
5 Chickens
12 Cows


3. GIC = x 3%
Bond = y 4%
x + y = 5000 ①
0.03x + 0.04y = 160 ②
① x -0.03x
-0.03x - 0.03y = -150 ③
0.03x + 0.04y = 160 ②
③ + ②
0.01y / 0.01 = 10 / 0.01
y = 1000 ④
Sub ④ in ①
x + 1000 = 5000
x = 5000 - 1000
x = 4000
She invested $1000 to the bond and 5000 in a GIC.


4.
x = dimes 0.10
y = quarters 0.25
x + y = 50 ①
0.10x + 0.25y = 9.50 ②
① x -0.10 -0.10x - 0.10y = -5 ③
0.10x + 0.25y = 9.50 ②
③ + ②
0.15y = 4.50
y = 30 ④
Sub ④ in ①
x + 30 = 50
x = 50 - 30
x = 20
20 dimes


5. small box = x
large box = y
6x + 10y = 110 ①
3x + 7y = 71 ②
② x -2
① + ③
6x + 10y = 110 ①
-6x - 14y = -142 ③
-4y = -32
y = 8 ④
sub ④ in ①
6x + 10(8) = 110
6x + 80 = 110
6x = 110 - 80
6x = 30
x = 5
5 small boxes
8 large boxes



6. quarters = x
dimes = y

$x + y = 30$ ①

$0.25x + 0.10y = 5.85$ ②

$\times -0.10y$

$-0.10x - 0.10y = -3$ ③

$0.25x + 0.10y = 5.85$ ②

$0.15x = 2.85$

$x = 19$ ④

sub ④ in ①

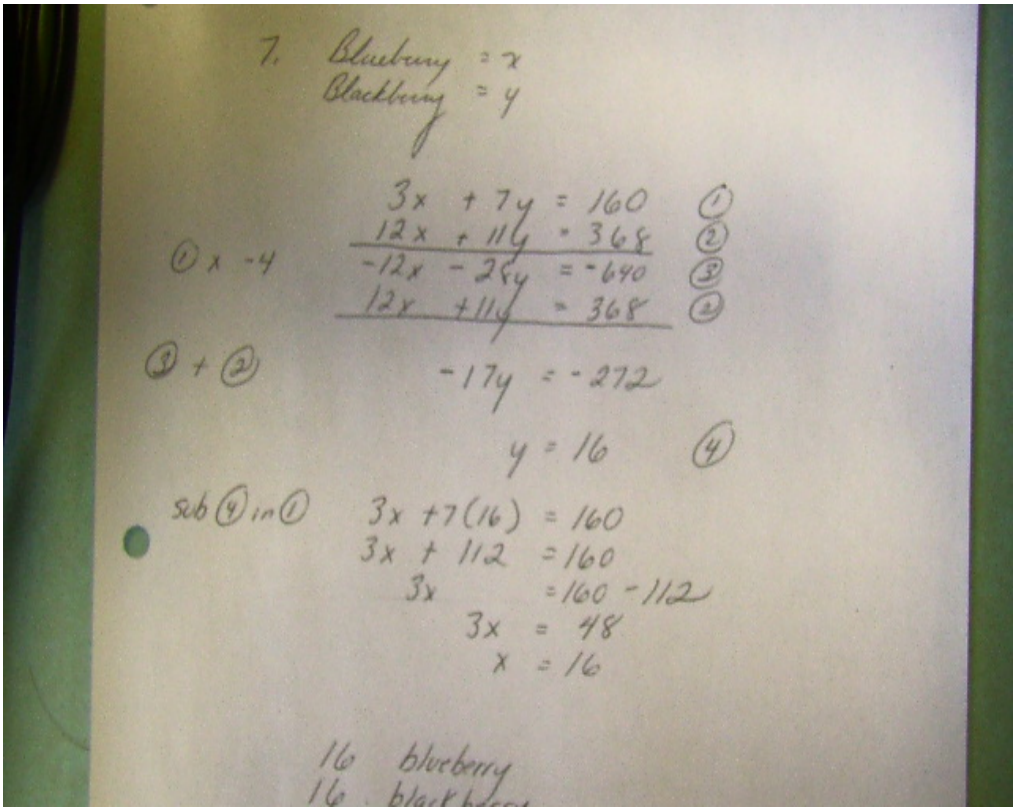
$19 + y = 30$

$y = 30 - 19$

$y = 11$

19 quarters

11 dimes



7. Blueberry = x
Blackberry = y

$3x + 7y = 160$ ①
$12x + 11y = 368$ ②

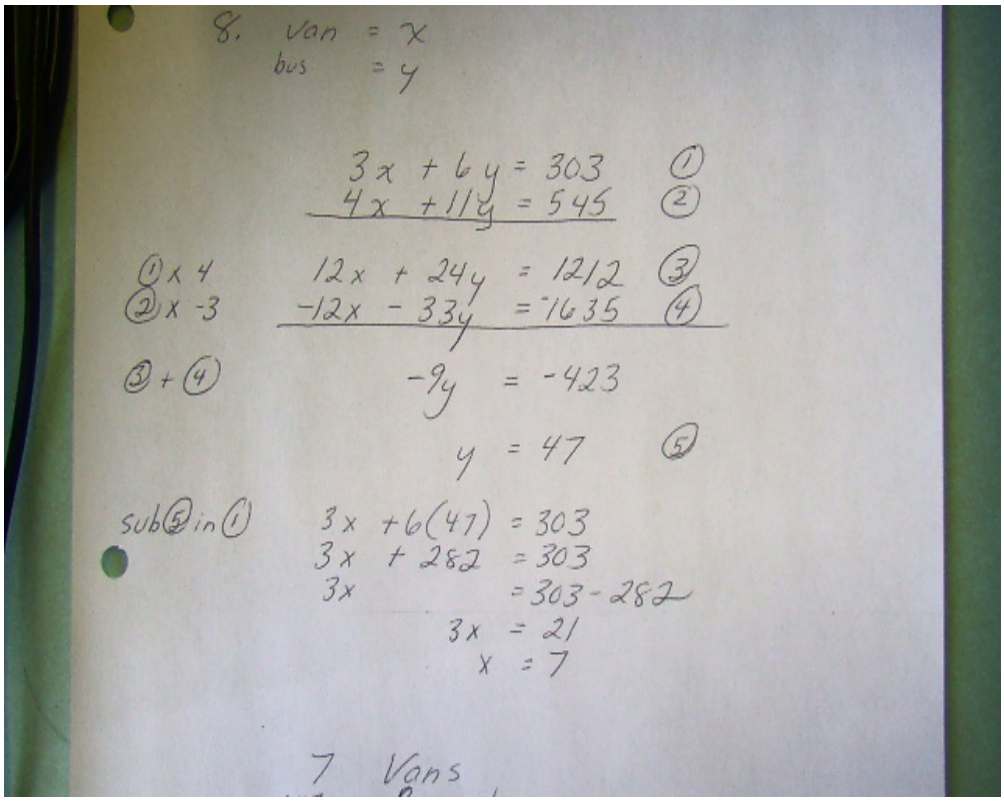
① × -4 $-12x - 28y = -640$ ③

③ + ② $-17y = -272$

$y = 16$ ④

Sub ④ in ① $3x + 7(16) = 160$
$3x + 112 = 160$
$3x = 160 - 112$
$3x = 48$
$x = 16$

16 blueberry
16 blackberry


8. van = x
bus = y
3x + 6y = 303 ①
4x + 11y = 545 ②
① x 4 12x + 24y = 1212 ③
② x -3 -12x - 33y = -1635 ④
③ + ④ -9y = -423
y = 47 ⑤
sub ⑤ in ①
3x + 6(47) = 303
3x + 282 = 303
3x = 303 - 282
3x = 21
x = 7
7 Vans