* Many ways to solve
* Can interchange variables, but answers should match!

HOMEWORK: Applications of Systems- Mixture

1.) Peanuts worth $2.25 a pound were mixed with cashews worth $3.25 a pound to produce a mixture worth $2.65 a pound. How many <u>pounds of each kind of nuts</u> were used to produce 35 pounds of the mixture?

P = lbs of Peanuts
C = lbs of cashews

	Amt	$	total cost
Peanuts	P	225	2.25p
Cashews	C	3.25	3.25c
Total	35	2.65	92.75

$(P + C = 35) \cdot -2.25$
$2.25p + 3.25c = 92.75$

$-2.25p + -2.25c = -78.75$
$+2.25p + 3.25c = 92.75$

$1c = 14$
$p = 21$

$\boxed{14 \text{ lbs of Cashews} \\ 21 \text{ lbs of peanuts}}$

2.) Coffee worth $2.95 a pound was mixed with coffee worth $3.50 a pound to produce a blend worth $3.30 a pound. How much of each kind of coffee was used to produce 44 pounds of blended coffee?

x = lbs of 2.95 coffee
y = lbs of 3.50 coffee

2.95	x	2.95	2.95x
3.50	y	3.50	3.50y
total	44	3.30	145.2

$(x + y = 44) \cdot -2.95$
$2.95x + 3.50y = 145.2$

$-2.95x + -2.95y = -129.8$
$2.95x + 3.50y = 145.2$
$.55y = 15.4$

$y = 28$
$x = 16$

$\boxed{16 \text{ lbs of } \$2.95 \text{ coffee} \\ 28 \text{ lbs of } \$3.50 \text{ coffee}}$

3.) A lab technician needs to make 1000g of 42% alcohol solution. The technician has some 40% alcohol solution and some 45% alcohol solution. How much of each must be used?

x = grams of 40% sol.
y = grams of 45% sol.

	Amt	%	total
40	x	.40	.40x
45	y	.45	.45y
total	1000	.42	420

$(x + y = 1000) \cdot -.4$
$.40x + .45y = 420$

$-.40x + -.40y = -400$
$+ .40x + .45y = 420$
$.05y = 20$

$y = 400$
$x = 600$

$\boxed{600 \text{ grams of } 40\% \\ \text{alcohol solution} \\ 400 \text{ grams of } 45\% \\ \text{alcohol solution}}$

4.) One alloy (mixture of metals) is 20% copper and another alloy is 60% copper. How much of each alloy should be used to make 100 grams of an alloy that is 45% copper?

X = grams of 20% copper

y = grams of 60% copper

	X	.20	.20x
20%	X	.20	.20x
60%	y	.60	.60y
Total	100	.45	45

$(x + y = 100) \cdot -.20$

$.20x + .60y = 45$

$-.20x + -.20y = -20$

$.20x + .60y = 45$

$.40y = 25$

$y = 62.5$

$x = 37.5$

37.5 grams of 20% copper
62.5 grams of 60% copper

5.) Starbursts candy worth $1.25 a pound was mixed with Skittles candy worth $1.50 a pound to produce a mixture of candy worth $1.35 a pound. How many pounds of each kind of candy were used to make 45 pounds of the mixture?

X = lbs of Starbursts

y = lbs of Skittles

		1.25	1.25x
Starbursts	X	1.25	1.25x
Skittles	y	1.50	1.35y
Total	45	1.35	60.75

$(x + y = 45) \cdot -1.25$

$1.25x + 1.50y = 60.75$

$-1.25x + -1.25y = -56.25$

$1.25x + 1.50y = 60.75$

$.25y = 4.5$

$y = 18$

$x = 27$

27 lbs of Starbursts
18 lbs of Skittles

6.) How many quarts of a 20% salt solution must a chemist mix with a 40% salt solution to make 40 quarts of a 25% salt solution?

X = qts of 20% salt

y = qts of 40% salt

		.20	.20x
20%	X	.20	.20x
40%	y	.40	.40y
total	40	.25	10

$(x + y = 40) \cdot -.20$

$.20x + .40y = 10$

$-.20x + -.20y = -8$

$.20x + .40y = 10$

$.20y = 2$

$y = 10$

$y = 10$

$x = 30$

30 qts of 20% salt sol.
10 qts of 40% salt sol.