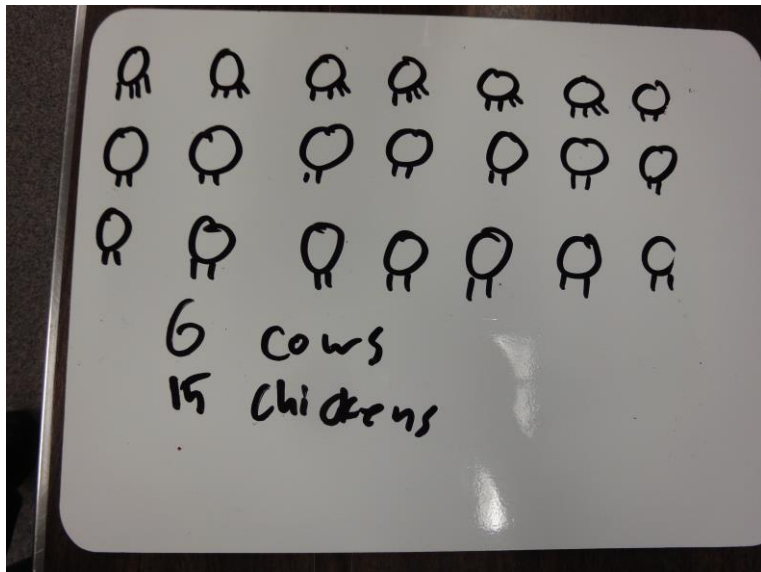
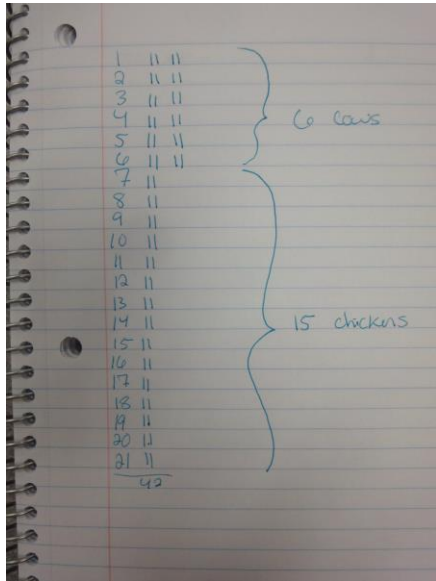


COWS & CHICKENS

Mari and Jens went to their aunt's farm. They noticed there were chickens in the cow pasture. Mari counted a total of 54 legs. Jens counted a total of 21 heads. How many chickens and how many cows were in the pasture?

There are nice, informal ways of approaching this problem:



Both of the above pictures show a strategy of starting with *all* chickens (we know there are 21 animals total). If all 21 are chickens, then there will be only $21 \times 2 = 42$ legs—well short of the 54 needed. Since we need $54 - 42 = 12$ more legs, we can add a pair of legs to 6 of the animals—in effect “transforming” the chickens into cows. This is displayed in both of the solutions above. This will give us 6 animals with 4 legs (so 6 cows) so the remaining 15 animals must be chickens. A more formal approach is to set up a system of equations and solve for each variable (the number of cows and the number of chickens) one at a time:

If C = the number of chickens and W = the number of cows, then

$$C + W = 21 \quad (\text{for the heads})$$

$$2C + 4W = 54 \quad (\text{for the legs})$$

If you multiply the top equation by -2 , this leads to $-2C - 2W = -42$. Adding this equation to $2C + 4W = 54$ results in $2W = 12$ (notice the C variable will cancel out) or $W = 6$ cows. Then since $C + W = 21$, $C = 15$ chickens. In problems where trial and error might be tedious, this is a great approach to use.

p. 373, #53:

$ST = \$5$ $NT = \$8$
 \downarrow \downarrow
 $x = \$5$ $y = \$8$

$-x + y = 500$
 $5x + 8y = 3,034$

$y = 500 - x$
 $5x + 8(500 - x) = 3034$
 $5x + 4000 - 8x = 3034$
 $-3x + 4000 = 3034$
 $-3x = 3034 - 4000$
 $-3x = -966$
 $3x = 966$
 $x = 322$

$y = 500 - 322$
 $y = 178$

$322 = x$
 $178 = y$

(the above shows a method called SUBSTITUTION)

53 from homework pg 373

(s) student tickets = \$5.00
(g) general tickets = \$8.00

Total = \$3,034 500 tickets sold

$5s + 8g = 3,034$
 $5s + g = 500$

$-7g = 2534$
 $7g = 2534$
 $g = 178$

$5s + 178 = 500$
 $5s = 322$
 $s = 322$

(the above shows a method called ELIMINATION)