

$$O + L = 47$$

$$L = 14$$

Now, I obtained L. Here I calculate O from the first equation:

$$O = 33$$

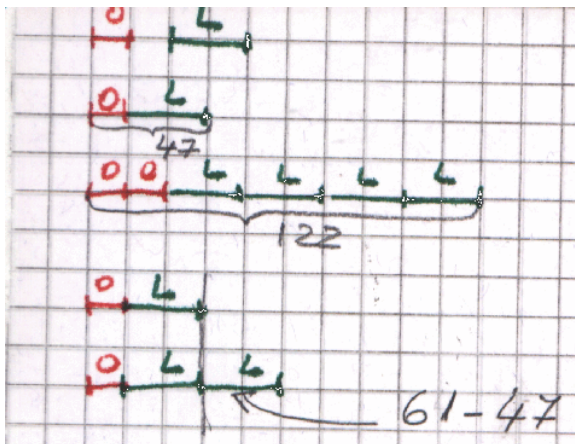
$$L = 14$$

Now, I verify my answer:

$$O + L = 47$$

$$2O + 4L = 122$$

This was using algebra. Some time before, before knowing about algebra, I solved this type of problem using arithmetic: the easiest way, as I remember, is to associate lengths of segments to the number of ostriches and to the number of llamas (see picture):



If the red segment is associated with the number of ostriches, and the green one with the number of llamas, adding their heads I obtain 47. Then, each ostrich has 2 legs, and each llama 4 – I obtain 122 legs. I see that the last segment, is composed by 2 red units and 4 green, so that I could divide its length in two using 1 red and 2 green segments.

Now, re-plotting the segments obtained adding heads, I see that the difference between the segments with half number of legs and number of heads is directly the number of llamas:

$$L = 61 - 47 = 14$$

The length of the other segment could be known if I subtract from the number of heads the number of llamas' heads, and I obtain number of ostriches' heads:

$$O = 47 - 14 = 33$$

i.e. the same result.

Scoring Rubric

A **problem-specific rubric** can be found linked from the problem to help in assessing student solutions. We consider each category separately when evaluating the students' work, thereby providing more focused information regarding the strengths and weaknesses in the work.

We hope these packets are useful in helping you make the most of Pre-Algebra Problems of the Week. Please let me know if you have ideas for making them more useful.

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