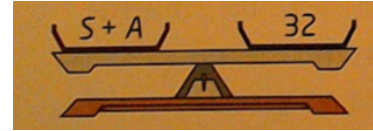


Substitution Method

Learning Goal

Minds on Math ...

Consider the following image:

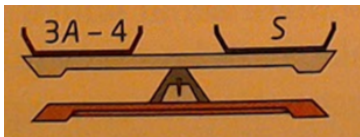


What might you *infer* from this representation?

Minds on Math ...

p2

Consider the following image:

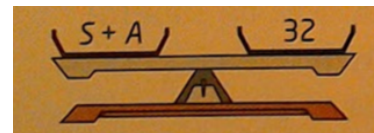


What might you *infer* from this representation?

Minds on Math ... Putting it Together

p3

Consider pairing the images now



What might you *deduce* from this representation?

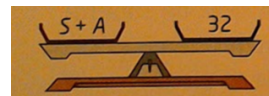
Connecting to a Linear System

Sometimes, at the beginning of class, Mr. Stewart gives his class some "zingers" to solve. One morning, the zinger was as follows:

"The sum of the number of cantons in Switzerland and the states in Austria is 32. Four less than triple the number of Austrian states is the same as the number of Swiss cantons. How many states are there in Austria, and how many cantons are there in Switzerland?"

Connecting to a Linear System (contd.)

L1:



L2:



What do we now know about the values of A and S in these equations?

"The sum of the number of cantons in Switzerland and the states in Austria is 32. Four less than triple the number of Austrian states is the same as the number of Swiss cantons. How many states are there in Austria, and how many cantons are there in Switzerland?"

Connecting to a Linear System (contd.)

L1:



What do we now know about the values of A and S in these equations?

L2:



"The sum of the number of cantons in Switzerland and the states in Austria is 32. Four less than triple the number of Austrian states is the same as the number of Swiss cantons. How many states are there in Austria, and how many cantons are there in Switzerland?"

Solving a Linear System by "Substitution"

Ex. 1.

"The sum of the number of cantons in Switzerland and the states in Austria is 32. Four less than triple the number of Austrian states is the same as the number of Swiss cantons. How many states are there in Austria, and how many cantons are there in Switzerland?"

$$S + A = 32 \quad \textcircled{1}$$

$$3A - 4 = S \quad \textcircled{2}$$

A Note About the "Substitution" Method

The goal of substitution is to find a way to eliminate one of the variables (with a system, you have at least two variables) and create a new equation with a single variable.

The goal of this algebraic method is to find the point of intersection.

In short, here's the method:

- Solve one of the equations for one unknown in terms of the other.
- Then substitute that in the other equation.
- This gives one equation in one unknown that can be solved.

Ex. 2.

Solve: $2x + 3y - 9 = 0$ ①

$x - y - 2 = 0$ ②

Ex. 3.

Solve: $5x + 2y = 18$ ①

$2x + 3y = 16$ ②

Practice

p39 #9acf, 8, 12 (research "break-even point"), 15, 17