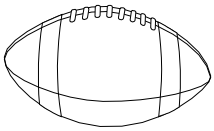
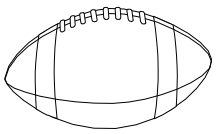


The Game of Algebra



Do you remember what we have studied so far?

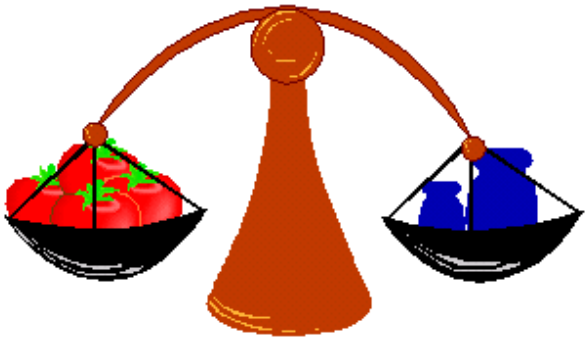
Rule #1: Substitution → If a = b, then _____.

Equipment: Algebraic term = the _____ of a _____ and _____.

Coefficient = The _____ part of an algebraic term.

Rule #2: Distributive Law → a (b + c) = _____, and a (b - c) = _____.

Rule #3: The Balance Rule



In English:
An algebraic equation is like a balance scale. If the two sides of the scale are in balance, then the weights in the two pans must be the same. In an equation, the equal sign means that the numerical value of the expression on the left hand side is the same as that on the right hand side.

You can add the same amount of weight to both pans (or subtract the same amount from both pans), and your scale will still be in balance. Similarly, you can do any mathematical operation you wish to your algebraic equation, as long as you **do the same thing to both sides of the equal sign**.

In algebra:

You can ADD the same number to both sides:

If $3x + 2 = 17$, and we add 5 to each side,

then $3x + 7 = 22$.

You can SUBTRACT the same number from both sides:

If $3x + 7 = 22$, and we subtract 7 from each side,

then $3x = 15$.

You can MULTIPLY both sides by the same number:

If $3x = 15$, and we multiply everything by 3,

then $9x = 45$.

You can DIVIDE both sides by the same number:

If $9x = 45$, and we divide both sides by 9,

then $x = 5$.