

BWH News Letter

Volume 4 Number 1

Why Do Two Negatives Make a Positive?

This has absolutely nothing to do with selling groceries. I just got into this conversation with some friends and was unable to find an answer that made sense. Then I started working on a weight and balance problem, and the answer became clear.

Why do two minuses become a positive when they are multiplied?

First of all you have to appreciate why minuses exist at all. Basically, they are there to provide symmetry around the number zero (see figure 1). If you didn't have negative numbers, you couldn't handle 5 minus six, plus seven. We know the answer should be six, but how can we get there if we don't have negative numbers? The interim result, minus 1 (5-6), could not exist. So if we look at a number line, with zero at the fulcrum we have negative numbers to the left and positive numbers to the right.

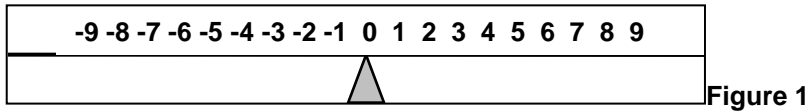


Figure 1

Now let's think of the number line as a seesaw with two five pound weights at each end. The seesaw is in balance and life is good.

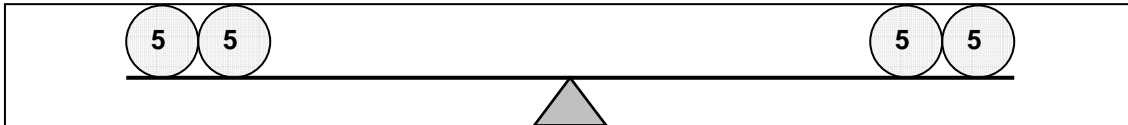


Figure 2

But now, let's subtract one of the five pound weights from the positive side. The seesaw is out of balance. How can we get it back in balance? We can always add the positive weight back to the positive side, but there is another option.

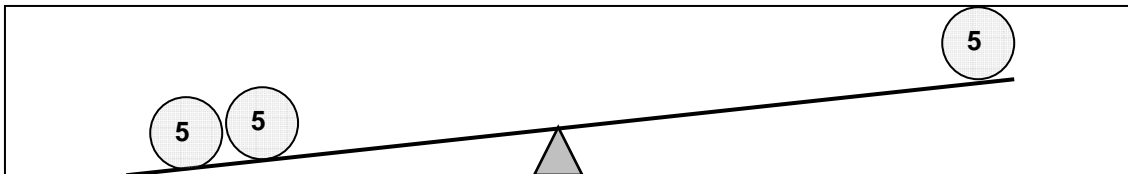


Figure 3

What if we just also remove a negative five pound weight from the negative side of the seesaw? It has the same effect as adding 5 pounds to the positive side and life is again good. Subtracting a negative is the same as adding a positive, so a minus times a minus yields a positive.

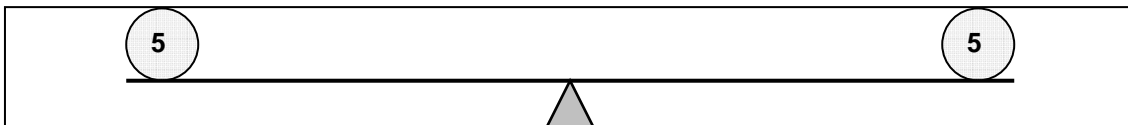


Figure 4