Worksheet 1.6 Signed Numbers

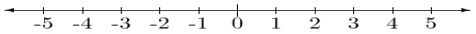
Section 1 Introduction to Signed Numbers

Signed numbers are positive and negative numbers. So far in the worksheets we have mainly talked about the counting numbers, which are all positive. In maths we call the set of these natural numbers $\mathbb{N}$. We have also talked about fractions. All fractions including whole numbers are in a set called the rationals and represented by the symbol $\mathbb{Q}$. If we include the negative numbers to the counting numbers we end up with the set of integers represented by $\mathbb{Z}$. The set of real numbers $\mathbb{R}$ includes positive and negative integers, fractions and irrational numbers.

If my cheque account was in credit \$30 I could say that the balance was +\$30. If it was overdrawn \$30 the balance would be -\$30. Temperatures are measured in degrees. In Sydney the average summer temperature is about $+27^o$. In Berlin the average winter temperature is about -10^o. In some way, we consider the negative of a number to be its opposite. If you were in debit \$30 and you made a deposit of \$30, i.e. you added \$30 to your account, you would have a zero balance. Since we consider $-b$ to be the opposite of b, what is $-(-b)$? It is the opposite of $-b$ which is b. This statement can be written as a rule:

Two negatives make a positive. Only in maths, of course.

When we want to picture the ordinary number system we can often think about it as a line which is infinitely long in both directions. We choose a point to be zero and the numbers to the right of zero are positive. The numbers to the left of zero are negative. The number line looks like this:



Fractions and other numbers can be fitted in on the number line. For instance $1\frac{1}{2}$ is half-way between 1 and 2. And $-1\frac{1}{2}$ is half-way between -1 and -2. If b is any point on the number line then $-b$ is the same distance from zero but on the opposite side of the number line.