

Definitions set prereqs

| Term | Notation | Example(s) | We say in English ... |
|-----------------------|----------------|------------|--|
| all reals | \mathbb{R} | | The (set of all) real numbers (numbers on the number line) |
| all integers | \mathbb{Z} | | The (set of all) integers (whole numbers including negatives, zero, and positives) |
| all positive integers | \mathbb{Z}^+ | | The (set of all) strictly positive integers |
| all natural numbers | \mathbb{N} | | The (set of all) natural numbers. Note: we use the convention that 0 is a natural number. |

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|----------------------|--|---|---|
| sequence | x_1, \dots, x_n | | A sequence x_1 to x_n |
| summation | $\sum_{i=1}^n x_i$ or $\sum_{i=1}^n x_i$ | | The sum of the terms of the sequence x_1 to x_n |
| piecewise definition | rule | $f(x) = \begin{cases} \text{rule 1 for } x & \text{when COND 1} \\ \text{rule 2 for } x & \text{when COND 2} \end{cases}$ | Define f of x to be the result of applying rule 1 to x when condition COND 1 is true and the result of applying rule 2 to x when condition COND 2 is true. This can be generalized to having more than two conditions (or cases). |
| function application | $f(7)$ $f(z)$ $f(g(z))$ | | f of 7 or f applied to 7 or the image of 7 under f f of z or f applied to z or the image of z under f f of g of z or f applied to the result of g applied to z |
| absolute value | $ -3 $ | | The absolute value of -3 |
| square root | $\sqrt{9}$ | | The non-negative square root of 9 |

Pro-tip: the meaning of two vertical lines $| \quad |$ depends on the data-types of what's between the lines. For example, when placed around a number, the two vertical lines represent absolute value. We've seen a single vertical line $|$ used as part of set builder definitions to represent "such that". Again, this is (one of the many reasons) why it is very important to declare the data-type of variables before we use them.