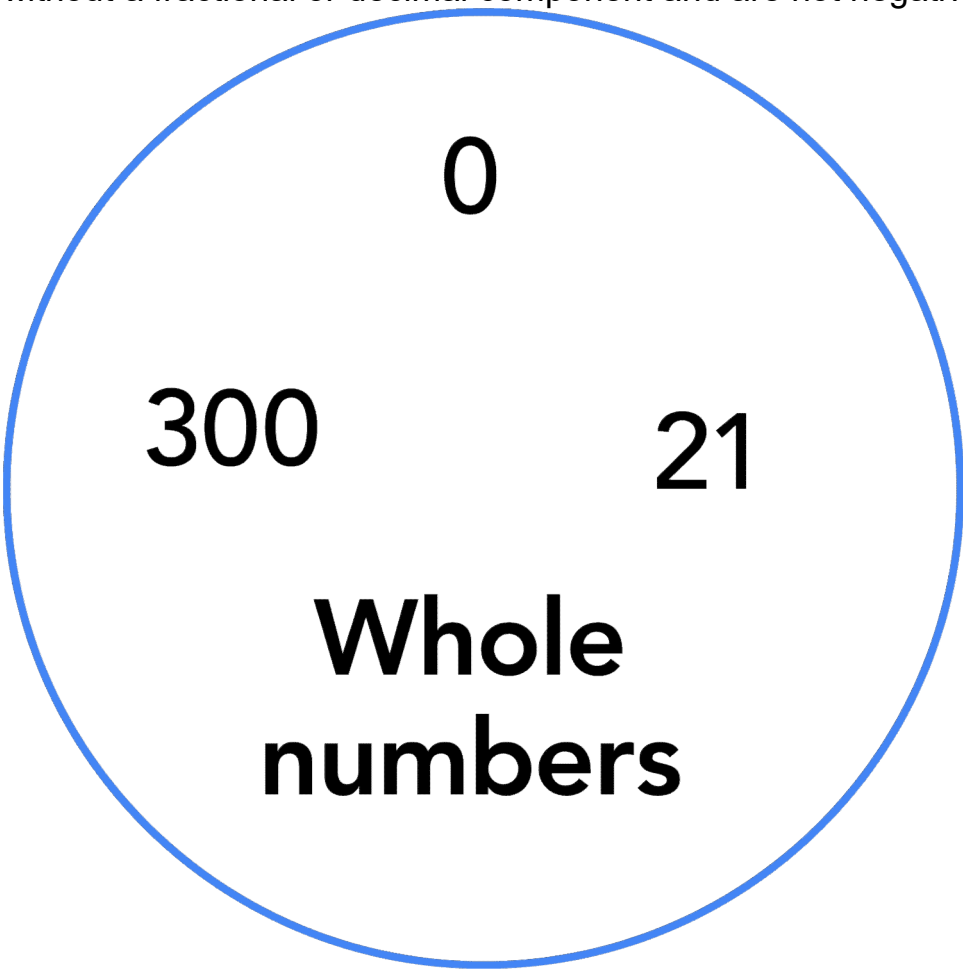
Applied Probability and Statistics

Wednesday, February 3, 2021 7:35 AM

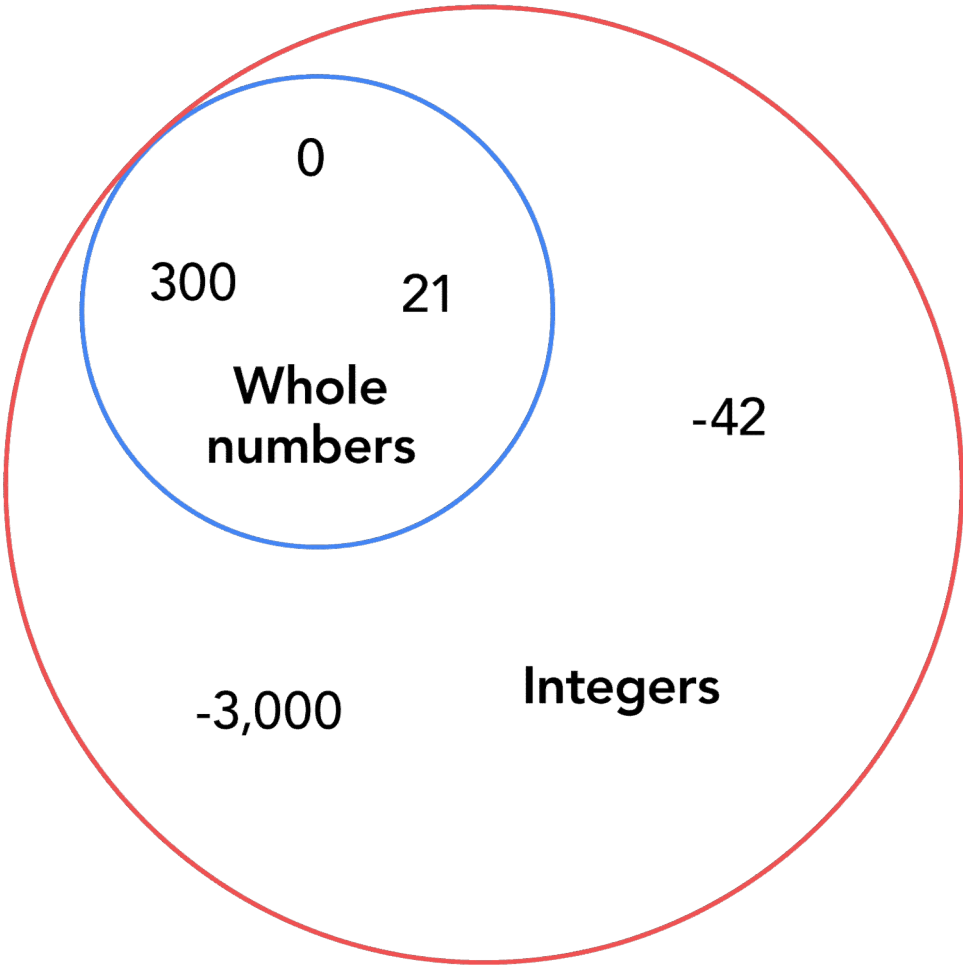
A whole number* is a number that we are familiar with from grade school. These numbers are:
0,1,2,3,4,5,6,7,8,9,...0,1,2,3,4,5,6,7,8,9,...
As the name indicates, "whole" numbers are numbers whose values are "whole," such as 11 or 22. Fractions or decimals, on the other hand, can be "parts of a whole," such as "one half." Whole numbers can be represented without a fractional or decimal component and are not negative.



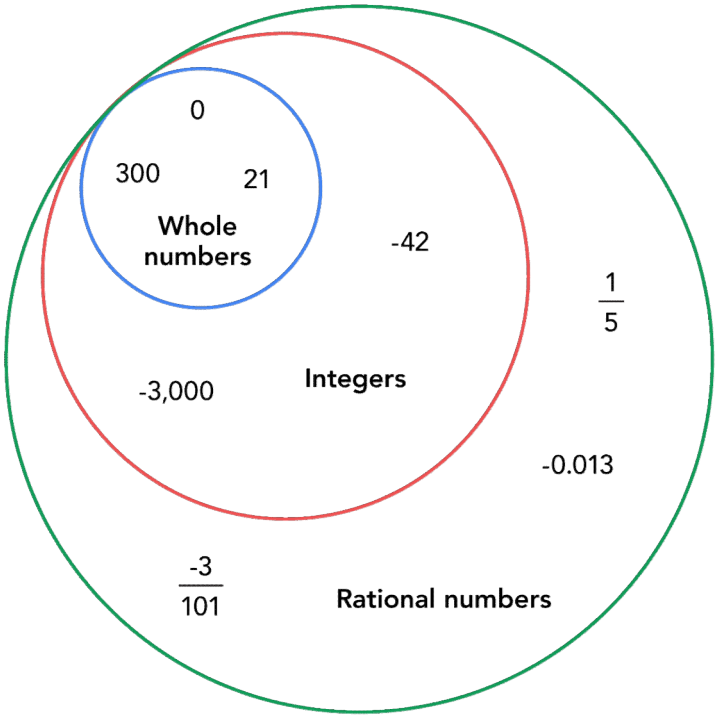
Integers*, like whole numbers, are numerical figures that do **not** contain a fractional or decimal component. Integers, unlike whole numbers, can be either a positive number*, a negative number*, or zero. The following number line displays integers:

Positive integers have a value that is greater than zero (meaning to the right of 00 on the number line), while negative integers are less than zero (or to the left of 00 on the number line). It is important to remember that zero is neither

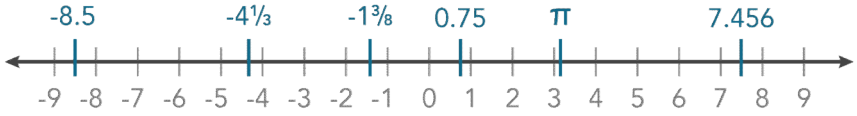
positive nor negative. (However, zero is considered an integer.)
Positive integers include:
1,2,3,4,5,6,7,8,9,...1,2,3,4,5,6,7,8,9,...
Negative integers are denoted by a minus sign directly in front of the integer. For example, "−5-5" is read as "negative five." Here are some examples of negative integers:
−1,−2,−3,−4,−5,−6,−7,−8,−9,...-1,-2,-3,-4,-5,-6,-7,-8,-9,...

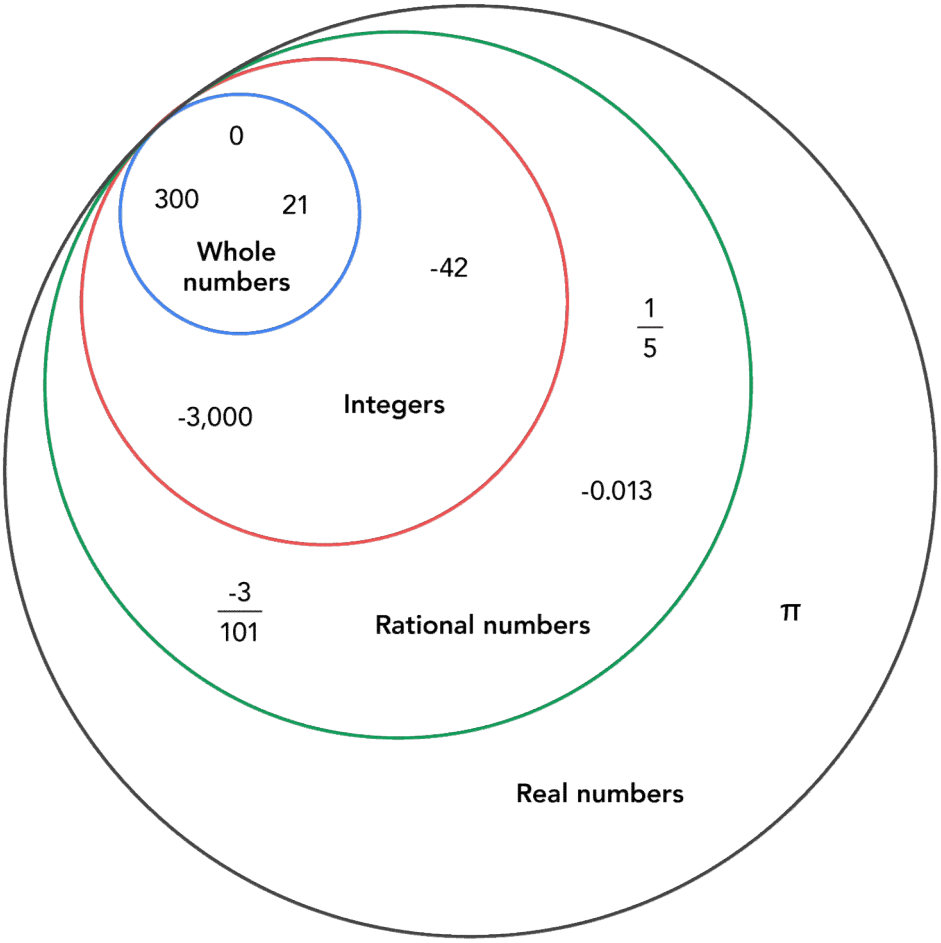


Rational numbers* are numbers that can be expressed as a fraction. This class of numbers includes all integers since any integer can be expressed as a fraction:
4=414=41
Rational numbers are also decimal numbers that have expansions that end or continue to repeat forever, rather than continuing forever without repeating. For example, −3101-3101 in decimal form is −0.02970297...-0.02970297..., which we can also write as $0.0297\overline{}$ 0.0297^{-} (with bar above 0297) which means the 0297 continues repeating forever.



As we continue to classify numbers, we come upon a group that includes integers and whole numbers *as well as* fractions and all decimals: real numbers*. A real number is any number that can be placed on the number line, whether that be negative or positive, fraction or decimal. Real numbers also include decimals that do not end and cannot be written as a fraction. An example of this is pi (sometimes written as ππ). Pi is approximated to 3.143.14, but the decimals do not end and do not repeat. Everything included on the number line below is considered a **real number**:





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