Logarithms are one of the most common math topics on the MCAT, appearing in questions in the Chemical and Physical Foundations of Biological Systems portion of the exam.

Briefly, there are two kinds of logarithms, the common logarithm (seen written as “log”) and the natural logarithm (seen written as “ln”). While they are related topics, because they have different applications on the MCAT and require different techniques to solve them without a calculator, they are covered in different MCAT Math guides.

This guide covers common logarithms – the kind that would be solved by hitting the “log” button on your calculator if you were allowed to use a calculator on the MCAT. They are most commonly required for solving general chemistry questions about pH, pOH, pKa and pKb.

Let’s start with an “easy” sample question:

**What is the pH of a 2.3x10-2 M HNO3 solution?**

Because HNO3 is a strong acid, we know that [H+] = 2.3x10-2 M and the pH is the –log of the concentration of H+ in the solution. Therefore,

pH = - log [H+]

= - log (2.3x10-2 )

= ?????

At this point the answer would be a snap to find using a calculator, but we don’t have that option on the MCAT, so we’re going to have to figure out how to solve this last step using some good approximation and mental math tricks.

Let’s take one more step backward. What is a logarithm anyway? It’s certainly not something we typically encounter outside a math or science class.