Assignment Week 11

COMP 150

Spring, 2021

An exponential function $f(x) = b^x$, where $b > 1$, is "eventually bigger than" a power function $g(x) = x^p$, where $p > 0$.

(1) Define the exponential function $f(x) = 2^x$ and the power function $g(x) = x^9$ in Sage for use throughout this assignment.

(2) What are the limits of $f(x)$ and $g(x)$ as x approaches infinity? Use Sage to support your claim. Explain your work.

(3) Which function is larger at $x = 0$? Use Sage to support your claim. Explain your work.

(4) At some x-value between 1 and 2, the exponential function is overtaken by the power function. Use Sage to support this claim. Use comments to explain your work and conclusions.

(5) At some x-value between 51 and 52 the functions intersect each other again. Use Sage to support this claim. Use comments to explain your work and conclusions.