Class 22: Using the Central Limit Theorem!
Calculus II
College of the Atlantic. Feb 27, 2023

It is well known that the average mass of wild unicorns is 100 kg with a standard deviation of 12.

1. In your cosmic ray unicorn-creation experiments you have created 55 unicorns. You measure the masses of these 55 unicorns and determine that their average mass is 96. Hmmm... Is the mass of this group of unicorns unusually low compared to wild unicorns?

   (a) If you sampled 55 wild unicorns, how would that mean be distributed?

   (b) How likely is it that sampling common unicorns would lead to a mean as or more extreme than the mean you found?

2. Repeat the above question for an experimental run in which you generated 55 unicorns and their average mass is 99 kg.

3. Repeat the above question for an experimental run in which you generated 900 unicorns and their average mass is 99 kg.

Figure 1: An illustration from the book The history of four-footed beasts and serpents by Edward Topsell. Special Collections, University of Huston Libraries. Creative Commons CC0 1.0 Universal Public Domain Dedication. https://commons.wikimedia.org/wiki/File:Oftheunicorn.jpg.