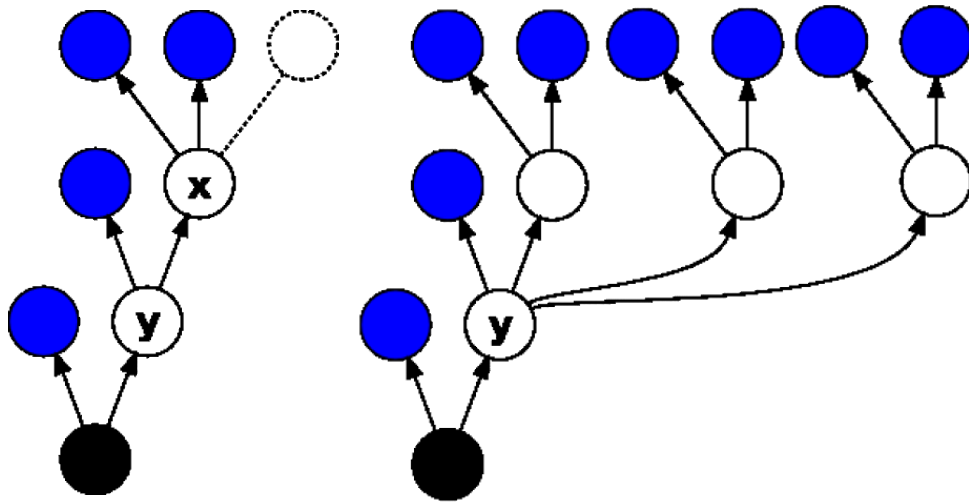# ON DEFEATING HYDRAS

Undergraduate Math Club
CORNELL UNIVERSITY

SPEAKER

Vivian Kuperberg

ABSTRACT

In the story of Hercules and the Lernaean Hydra, every time Hercules chopped off one of the hydra's heads, the hydra grew two heads in its place. We will consider a hydra whose heads form a tree, and for the nth head that Hercules chops, the hydra produces n copies of whatever else was growing from the base of the neck, at the same point. Surprisingly, the hydra is defeatable, and I will show that *any* strategy that Hercules chooses will eventually work. In doing so, I'll introduce the set-theoretic notion of the ordinals, and prove that any Goodstein sequence terminates.

OCT 17 at 4:45pm

Malott 532 ⋆ Refreshments