MAT292
Lecture 1 Exercise

QiLin Xue

Fall 2021

Exercise: Let's consider some suggestions for an ODE describing the temperature of a coffee cup in a room. Each of the following suggested ODEs contradicts our intuition in some way. How?

Equation	Which "law(s)" does it contradict?
$y' = y^2$	• The temperature can never decrease. • The temperature doesn't depend on T • The rate of increase of
$y' = y'' + 2y$	
$y' = \dfrac{T}{y}$	
$y' = y[e^{y-T} + y^3]$	
$y' = y - T$	
$y' = T - y$	