

11. [9 points] Provide an example for each of the following. Your example must clearly satisfy the given properties. If no example exists then write DOES NOT EXIST and briefly explain why no such example exists.
- a. [3 points] A differential equation that has at least one equilibrium solution that is stable and at least one equilibrium solution that is not stable. (A complete answer consists of the differential equation and both of these equilibrium solutions.)

Answer: Differential Equation: _____ = _____

Equilibrium Solutions: Stable: _____ Not Stable: _____

- b. [3 points] A continuous function $f(x)$ such that $\text{LEFT}(2) \leq \text{RIGHT}(2) \leq \int_0^2 f(x) dx$ where $\text{LEFT}(2)$ and $\text{RIGHT}(2)$ are, respectively, the left- and right- hand Riemann sum estimates for $\int_0^2 f(x) dx$ with two equal subintervals.

You may describe your function f by giving a formula or by drawing a clear and well-labeled graph. Then briefly explain why your function is indeed such an example.

Answer: $f(x) =$ _____

Brief explanation:

- c. [3 points] Give an example of a power series whose radius of convergence is 0. (You must use sigma notation for full credit.)

Answer: Power Series: _____