1. **HW Week\_10\_1**

Consider a non-linear differential equation

1. Find stationary points?
2. At the initial point draw the trajectory.
3. At the initial point , draw the trajectory. %%%
4. **HW\_Week\_10\_2**

Consider a random variable which is a non-linear transform of a gaussian R.V.

1. prove pdf of as (1) and find the mean and the variance if

%% Hint : to get the mean and variance, using symbolic math in matlab

1. To get the mean and the variance of y, use Monte Carlo with different number of simulation to see the result, i.e., n = 1000,5000, 50000.
2. Prove , Here and we may call this is ‘kurtosis” in the case of
3. **HW\_Week\_10\_3**

Let , consider a non-linear transform

Find the mean and the variance of using

1. Linearized method
2. Monte Carlo method(N = 100, 1000)
3. Unscented transform method