Task 3

Consider the systems:

1.

$$\dot{x}_1 = -x_2 - 1.5x_1^2 - 0.5x_1^3$$
$$\dot{x}_2 = u$$

2.

$$\dot{x}_1 = -x_2 - 1.5x_1^2 - 0.5x_1^3$$
$$\dot{x}_2 = x_3$$
$$\dot{x}_3 = u$$

It is assumed that all state vector is measurable.

Using backstepping, synthesize a state feedback controller to globally stabilize the origin.