Problem 9.39:

39.* Find the reduced form of the following state model.

$$\begin{bmatrix} \dot{x}_1 \\ \dot{x}_2 \end{bmatrix} = \begin{bmatrix} -4 & -1 \\ 2 & -3 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \end{bmatrix} + \begin{bmatrix} 2 \\ 5 \end{bmatrix} u(t)$$

```
% Problem 9.39

clc
clear
disp('Problem 9.39: Scott Thomas')

A = [-4, -1; 2, -3]
B = [2; 5]
C = [1, 0]
D = 0
sys1 = ss(A,B,C,D)
[right,left] = tfdata(sys1,'v')
```

```
Problem 9.39: Scott Thomas

A =

    -4    -1
     2    -3


B =

     2
     5


C =

     1     0


D =

     0


sys1 =

  a =
       x1  x2
   x1  -4  -1
   x2   2  -3

  b =
       u1
   x1   2
```

```
   x2   5

  c =
       x1  x2
   y1   1   0

  d =
       u1
   y1   0

Continuous-time state-space model.


right =

         0    2.0000    1.0000


left =

     1     7    14
```

The resulting equation is:

$$\ddot{x} + 7\dot{x} + 14x = 2\dot{u} + u$$