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Problem 1

x_dot = Ax + Bu y = Cx + Du

```
A = [1 0; 4 -1];
B = [-1;2];
C = [3 0];
D = 5;
```

a)

b) Eigen value decomposition

```
[V,J] = jordan(A);
% Compute the state stransition matrix
syms t;
V*expm(J*t)*inv(V);
```

c) Cayley-Hamilton

```
A^2 - eye(2)
```

```
ans =

     0     0
     0     0
```

d) Find the state transfer function G(s)

G(s) = C*inv(SI-A)*B + D

```
syms s;
C*inv(s*eye(2)-A)*B + D
```

```
ans =

5 - 3/(s - 1)
```

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