

```
% Not reachable! Rank < 3
fprintf('Rank of G: %d\n',rank(G))

% Reachable subspace:
[Q,R] = qr(G);
reachable = Q(:,1:2);
fprintf('Reachable subspace:\n')
disp(reachable)

[Q,R] = qr(G');
unreachable = Q(:,3);
fprintf('Unreachable subspace:\n')
disp(unreachable)
```

Rank of A: 3

Phi =

$$\begin{bmatrix} 0.2927e^{-6.6275t} + 0.2073e^{-0.77254t} + 0.5e^{-4.2t} & 0.44407e^{-0.77254t} - 0.44407e^{-6.6275t} & 0.2927e^{-6.6275t} + 0.2073e^{-0.77254t} - 0.5e^{-4.2t} \\ 0.27327e^{-0.77254t} - 0.27327e^{-6.6275t} & 0.4146e^{-6.6275t} + 0.5854e^{-0.77254t} & 0.27327e^{-0.77254t} - 0.27327e^{-6.6275t} \\ 0.2927e^{-6.6275t} + 0.2073e^{-0.77254t} - 0.5e^{-4.2t} & 0.44407e^{-0.77254t} - 0.44407e^{-6.6275t} & 0.2927e^{-6.6275t} + 0.2073e^{-0.77254t} + 0.5e^{-4.2t} \end{bmatrix}$$

G =

```
0.1492    0.0486    0.0209
0.0486    0.0338    0.0189
0.0209    0.0189    0.0117
```

Rank of G: 3

$$u = 3219.0e^{-6.6275t} + 353.32e^{-0.77254t} - 3094.2e^{-4.2t}$$

$$3219.0 * \exp(-6.6275 * \text{conj}(t)) + 353.32 * \exp(-0.77254 * \text{conj}(t)) - 3094.2 * \exp(-4.2 * \text{conj}(t))$$

G =

```
0.5115    0.6340    0.5115
0.6340    0.7902    0.6340
0.5115    0.6340    0.5115
```

Rank of G: 2

Reachable subspace:

```
-0.5318    0.4661
-0.6591   -0.7521
-0.5318    0.4661
```

Unreachable subspace:

```
-0.7071
-0.0000
0.7071
```