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Exercise 1

```
n =

     3


Si =

     1     0     0
     0     1     0
     0     0     1


ai =

    -3


Si =

    -3     0     2
     1    -3     1
     0     1     0


ai =

    -1


Si =

    -1     2     0
    -3     0     2
     1     0     0


ai =

    -2
```

```
a =

     1    -3    -1    -2


b =

     2    -6    -2    -3


b1 =

     2    -6    -2    -3


a1 =

     1    -3    -1    -2


S1 =

  1×3 cell array

    {3×3 double}    {3×3 double}    {3×3 double}


ans =

  2 s^3 - 6 s^2 - 2 s - 3
  -----------------------
    s^3 - 3 s^2 - s - 2

Continuous-time transfer function.


n =

     3


Si =

     1     0     0
     0     1     0
     0     0     1


ai =

    -8


Si =
```

```
         0   24.0000         0
    0.5000   -8.0000         0
         0    2.0000   -8.0000


ai =

   -12


Si =

     0     0     0
     0     0     0
     1   -16   -12


ai =

     0


a =

     1    -8   -12     0


b =

    1.0000   -8.0000  -12.0000    0.2500


b2 =

    1.0000   -8.0000  -12.0000    0.2500


a2 =

     1    -8   -12     0


S2 =

  1×3 cell array

    {3×3 double}    {3×3 double}    {3×3 double}


ans =

  s^3 - 8 s^2 - 12 s + 0.25
  -------------------------
```

```
     s^3 - 8 s^2 - 12 s

Continuous-time transfer function.


n =

     4


Si =

     1     0     0     0
     0     1     0     0
     0     0     1     0
     0     0     0     1


ai =

     7


Si =

     3    -2     0     0
     3     6     0     0
     0     0     6     1
     0     0     1     6


ai =

    20


Si =

     2    -4     0     0
     6     8     0     0
     0     0    15     5
     0     0     5    15


ai =

    20


Si =

     0     0     0     0
     0     0     0     0
     0     0    10    10
```

```
     0     0    10    10

ai =

     0

a =

     1     7    20    20     0

b =

    -1    -5   -22   -32     0

b3 =

    -1    -5   -22   -32     0

a3 =

     1     7    20    20     0

S3 =

  1×4 cell array

    {4×4 double}    {4×4 double}    {4×4 double}    {4×4 double}

ans =

  -s^2 - 3 s - 16
  ---------------
  s^2 + 5 s + 10

Continuous-time transfer function.
```

Exercise 2

```
r =

    0.0926
    0.8333
    0.5185
   -0.4444
```

```
p =

   -0.5000
    0.5000
    0.2500
         0


k =

     []


r =

  -1.0000 - 1.5000i
  -1.0000 + 1.5000i
   1.5000 + 0.0000i
   0.5000 + 0.0000i


p =

   0.5000 + 0.5000i
   0.5000 - 0.5000i
   0.3333 + 0.0000i
   0.0000 + 0.0000i


k =

     []
```

Exercise 3

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