Type	Char. Poly.	Count
name-1		
symmetric	$t^3(t-1)$	9
	$(t-1)^2(t+t^2+1)$	1
	$t^2(t+t^2+1)$	6
triples	$\{t^4, t^4, t^4\}$	11

Col Number	Rank
1	1
2	2
3	1
4	2
5	2
6	4
7	2
8	2
9	1
10	1
11	1
12	1
13	1
14	2
15	1
16	1

Rs 16 - Soln 1

rank(kron(eye(4), 6) - kron(6', eye(4))) = 10

rank([kron(eye(4), 6) - kron(6', eye(4)); kron(eye(4), 2) - kron(4', eye(4))]) = 16

rank([kron(eye(4), 6) - kron(6', eye(4)); kron(eye(4), 2) - kron(5', eye(4))]) = 15

rank([kron(eye(4), 6) - kron(6', eye(4)); kron(eye(4), 2) - kron(7', eye(4))]) = 14

rank([kron(eye(4), 6) - kron(6', eye(4)); kron(eye(4), 2) - kron(8', eye(4))]) = 16

rank([kron(eye(4), 6) - kron(6', eye(4)); kron(eye(4), 2) - kron(14', eye(4))]) = 16

rank([kron(eye(4), 6) - kron(6', eye(4)); kron(eye(4), 4) - kron(14', eye(4))]) = 15

$2 \Leftrightarrow 5 \Leftrightarrow 7$

$4 \Leftrightarrow 14$

8 by itself (multiple of the identity)

[U, S, V] = svd([kron(eye(4), 6) - kron(6', eye(4)); kron(eye(4), reshape(Rs16Rc1111(:, 8), 4, 4)) - kron(reshape(Rs16Rc1111(:, 8), 4, 4)', eye(4))]); V(:, end)

Type	Char. Poly.	Count
`name-1`		
symmetric	$t^3(t-1)$	9
	$(t-1)^2(t+t^2+1)$	1
	$t^2(t+t^2+1)$	6
triples	$\{t^4, t^4, t^4\}$	11

Col Number	Rank
1	1
2	1
3	2
4	2
5	2
6	4
7	2
8	1
9	1
10	1
11	1
12	2
13	1
14	2
15	1
16	1

Rs 16 - Soln 2
$3 \Leftrightarrow 4 \Leftrightarrow 5 \Leftrightarrow 14$
7 and 12 by themselves
12 is not the identity times a constant!

Type	Char. Poly.	Count
`name-1`		
symmetric	$t^3(t-1)$	9
	$(t-1)^2(t+t^2+1)$	1
	$t^2(t+t^2+1)$	6
triples	$\{t^4, t^4, t^4\}$	11

Col Number	Rank
1	1
2	2
3	2
4	1
5	2
6	1
7	1
8	1
9	1
10	1
11	1
12	2
13	2
14	4
15	2
16	1

Rs 16 - Soln 3
$2 \Leftrightarrow 3 \Leftrightarrow 5 \Leftrightarrow 12 \Leftrightarrow 13 \Leftrightarrow 15$
All related!?

Type	Char. Poly.	Count
name-1		
symmetric	$t^3(t-1)$	9
	$(t-1)^2(t+t^2+1)$	1
	$t^2(t+t^2+1)$	6
triples	$\{t^4, t^4, t^4\}$	11

Col Number	Rank
1	1
2	2
3	2
4	1
5	2
6	1
7	1
8	1
9	2
10	1
11	2
12	2
13	1
14	4
15	1
16	1

Rs 16 - Soln 4
2 11 12
3 9
5 is by itself, not a multiple of the identity!

Type	Char. Poly.	Count
name-1		
symmetric	$t^3(t-1)$	9
	$(t-1)^2(t+t^2+1)$	1
	$t^2(t+t^2+1)$	6
triples	$\{t^4, t^4, t^4\}$	11

Col Number	Rank
1	1
2	1
3	2
4	1
5	2
6	1
7	2
8	2
9	2
10	1
11	1
12	1
13	1
14	2
15	1
16	4

Rs 16 - Soln 5
$3 \Leftrightarrow 5 \Leftrightarrow 7 \Leftrightarrow 14$
8 9

Type	Char. Poly.	Count
name-1		
symmetric	$t^3(t-1)$	9
	$(t-1)^2(t+t^2+1)$	1
	$t^2(t+t^2+1)$	6
triples	$\{t^4, t^4, t^4\}$	11

Col Number	Rank
1	2
2	1
3	1
4	1
5	2
6	1
7	2
8	1
9	1
10	2
11	2
12	1
13	4
14	1
15	1
16	2

Rs 16 - Soln 6
1 7 10 16
5 by itself (multiple of the identity)
11 by itself (multiple of the identity)

Type	Char. Poly.	Count
name-1		
symmetric	$t^3(t-1)$	9
	$(t-1)^2(t+t^2+1)$	1
	$t^2(t+t^2+1)$	6
triples	$\{t^4, t^4, t^4\}$	11

Col Number	Rank
1	2
2	1
3	1
4	2
5	2
6	1
7	4
8	1
9	1
10	2
11	2
12	1
13	2
14	1
15	1
16	1

Rs 16 - Soln 7
1 10 11 13
5 is by itself (not a multiple of the identity)
4 is by itself (multiple of the identity)

Type	Char. Poly.	Count
`name-1`		
symmetric	$t^3(t-1)$	9
	$(t-1)^2(t+t^2+1)$	1
	$t^2(t+t^2+1)$	6
triples	$\{t^4, t^4, t^4\}$	11

Col Number	Rank
1	2
2	1
3	2
4	4
5	1
6	2
7	2
8	1
9	1
10	2
11	1
12	2
13	1
14	1
15	1
16	1

Rs 16 - Soln 8 1 3 7 12
6 10

Type	Char. Poly.	Count
name-1		
symmetric	$t^3(t-1)$	9
	$(t-1)^2(t+t^2+1)$	1
	$t^2(t+t^2+1)$	6
triples	$\{t^4, t^4, t^4\}$	11

Col Number	Rank
1	1
2	2
3	1
4	1
5	4
6	2
7	1
8	2
9	1
10	2
11	1
12	2
13	1
14	1
15	2
16	1

Rs 16 - Soln 9
2 8 10 12
6 is by itself (multiple of the identity)
15 is by itself (multiple of the identity)

Type	Char. Poly.	Count
name-1		
symmetric	$t^3(t-1)$	9
	$(t-1)^2(t+t^2+1)$	1
	$t^2(t+t^2+1)$	6
triples	$\{t^4, t^4, t^4\}$	11

Col Number	Rank
1	2
2	1
3	1
4	1
5	2
6	1
7	1
8	1
9	1
10	2
11	2
12	1
13	2
14	4
15	1
16	2

Rs 16 - Soln 10
1 13 16 5 10 11 All related

Type	Char. Poly.	Count
name-1		
symmetric	$t^3(t-1)$	9
	$(t-1)^2(t+t^2+1)$	1
	$t^2(t+t^2+1)$	6
triples	$\{t^4, t^4, t^4\}$	11

Col Number	Rank
1	2
2	1
3	1
4	4
5	2
6	1
7	1
8	1
9	2
10	1
11	2
12	1
13	2
14	1
15	2
16	1

Rs 16 - Soln 11
1 5 9 11 13 15 All related (all odds)

Type	Char. Poly.	Count
name-1		
symmetric	$t^3(t-1)$	9
	$(t-1)^2(t+t^2+1)$	1
	$t^2(t+t^2+1)$	6
triples	$\{t^4, t^4, t^4\}$	11

Col Number	Rank
1	1
2	4
3	2
4	1
5	1
6	1
7	1
8	1
9	2
10	1
11	1
12	2
13	2
14	2
15	1
16	2

Rs 16 - Soln 12
3 13 14
9 16
12 is by itself (multiple of the identity)

Type	Char. Poly.	Count
name-1		
symmetric	$t^3(t-1)$	9
	$(t-1)^2(t+t^2+1)$	1
	$t^2(t+t^2+1)$	6
triples	$\{t^4, t^4, t^4\}$	11

Col Number	Rank
1	1
2	1
3	1
4	4
5	2
6	1
7	1
8	1
9	2
10	2
11	2
12	2
13	1
14	2
15	1
16	1

Rs 16 - Soln 13
5 is by itself (not a multiple of the)
9 10 11 12 14

Type	Char. Poly.	Count
name-1		
symmetric	$t^3(t-1)$	9
	$(t-1)^2(t+t^2+1)$	1
	$t^2(t+t^2+1)$	6
triples	$\{t^4, t^4, t^4\}$	11

Col Number	Rank
1	2
2	1
3	1
4	1
5	2
6	2
7	2
8	4
9	1
10	1
11	1
12	2
13	2
14	1
15	1
16	1

Rs 16 - Soln 14

Type	Char. Poly.	Count
name-1		
symmetric	$t^3(t-1)$	9
	$(t-1)^2(t+t^2+1)$	1
	$t^2(t+t^2+1)$	6
triples	$\{t^4, t^4, t^4\}$	11

Col Number	Rank
1	2
2	1
3	2
4	2
5	1
6	1
7	1
8	1
9	1
10	2
11	4
12	1
13	1
14	2
15	2
16	1

Rs 16 - Soln 15

Type	Char. Poly.	Count
name-1		
symmetric	$t^3(t-1)$	9
	$(t-1)^2(t+t^2+1)$	1
	$t^2(t+t^2+1)$	6
triples	$\{t^4, t^4, t^4\}$	11

Col Number	Rank
1	2
2	1
3	1
4	2
5	1
6	1
7	1
8	1
9	1
10	2
11	2
12	1
13	1
14	2
15	2
16	4

Rs 16 - Soln 16

Type	Char. Poly.	Count
name-1		
symmetric	$t^3(t-1)$	9
	$(t-1)^2(t+t^2+1)$	1
	$t^2(t+t^2+1)$	6
triples	$\{t^4, t^4, t^4\}$	11

Col Number	Rank
1	1
2	2
3	1
4	2
5	1
6	1
7	2
8	1
9	2
10	1
11	2
12	2
13	1
14	4
15	1
16	1

Rs 16 - Soln 17

Type	Char. Poly.	Count
name-1		
symmetric	$t^3(t-1)$	9
	$(t-1)^2(t+t^2+1)$	1
	$t^2(t+t^2+1)$	6
triples	$\{t^4, t^4, t^4\}$	11

Col Number	Rank
1	1
2	1
3	1
4	1
5	2
6	1
7	2
8	1
9	1
10	1
11	2
12	2
13	2
14	4
15	2
16	1

Rs 16 - Soln 18

Type	Char. Poly.	Count
name-1		
symmetric	$t^3(t-1)$	9
	$(t-1)^2(t+t^2+1)$	1
	$t^2(t+t^2+1)$	6
triples	$\{t^4, t^4, t^4\}$	11

Col Number	Rank
1	2
2	1
3	4
4	2
5	2
6	1
7	2
8	1
9	1
10	1
11	2
12	1
13	2
14	1
15	1
16	1

Rs 16 - Soln 19

Type	Char. Poly.	Count
name-1		
symmetric	$t^3(t-1)$	9
	$(t-1)^2(t+t^2+1)$	1
	$t^2(t+t^2+1)$	6
triples	$\{t^4, t^4, t^4\}$	11

Col Number	Rank
1	2
2	1
3	2
4	1
5	1
6	1
7	1
8	1
9	1
10	2
11	2
12	2
13	4
14	2
15	1
16	1

Rs 16 - Soln 20

Type	Char. Poly.	Count
name-1		
symmetric	$t^3(t-1)$	9
	$(t-1)^2(t+t^2+1)$	1
	$t^2(t+t^2+1)$	6
triples	$\{t^4, t^4, t^4\}$	11

Col Number	Rank
1	2
2	4
3	2
4	2
5	1
6	2
7	1
8	2
9	2
10	1
11	1
12	1
13	1
14	1
15	1
16	1

Rs 16 - Soln 21

Type	Char. Poly.	Count
name-1		
symmetric	$t^3(t-1)$	9
	$(t-1)^2(t+t^2+1)$	1
	$t^2(t+t^2+1)$	6
triples	$\{t^4, t^4, t^4\}$	11

Col Number	Rank
1	1
2	1
3	1
4	2
5	1
6	1
7	2
8	1
9	4
10	1
11	1
12	2
13	2
14	2
15	2
16	1

Rs 16 - Soln 22

Type	Char. Poly.	Count
name-1		
symmetric	$t^3(t-1)$	9
	$(t-1)^2(t+t^2+1)$	1
	$t^2(t+t^2+1)$	6
triples	$\{t^4, t^4, t^4\}$	11

Col Number	Rank
1	1
2	2
3	2
4	1
5	4
6	2
7	1
8	1
9	1
10	1
11	2
12	2
13	2
14	1
15	1
16	1

Rs 16 - Soln 23

Type	Char. Poly.	Count
name-1		
symmetric	$t^3(t-1)$	9
	$(t-1)^2(t+t^2+1)$	1
	$t^2(t+t^2+1)$	6
triples	$\{t^4, t^4, t^4\}$	11

Col Number	Rank
1	2
2	4
3	1
4	2
5	1
6	2
7	1
8	2
9	1
10	2
11	1
12	2
13	1
14	1
15	1
16	1

Rs 16 - Soln 24

Type	Char. Poly.	Count
name-1		
symmetric	$t^3(t-1)$	9
	$(t-1)^2(t+t^2+1)$	1
	$t^2(t+t^2+1)$	6
triples	$\{t^4, t^4, t^4\}$	11

Col Number	Rank
1	2
2	1
3	1
4	2
5	1
6	1
7	1
8	2
9	1
10	1
11	4
12	1
13	2
14	1
15	2
16	2

Rs 16 - Soln 25

Type	Char. Poly.	Count
name-1		
symmetric	$t^3(t-1)$	9
	$(t-1)^2(t+t^2+1)$	1
	$t^2(t+t^2+1)$	6
triples	$\{t^4, t^4, t^4\}$	11

Col Number	Rank
1	2
2	4
3	2
4	1
5	1
6	1
7	2
8	2
9	1
10	1
11	1
12	1
13	2
14	1
15	1
16	2

Rs 16 - Soln 26

Type	Char. Poly.	Count
name-1		
symmetric	$t^3(t-1)$	9
	$(t-1)^2(t+t^2+1)$	1
	$t^2(t+t^2+1)$	6
triples	$\{t^4, t^4, t^4\}$	11

Col Number	Rank
1	1
2	2
3	4
4	1
5	1
6	1
7	2
8	2
9	1
10	1
11	2
12	1
13	2
14	1
15	2
16	1

Rs 16 - Soln 27

Type	Char. Poly.	Count
name-1		
symmetric	$t^3(t-1)$	9
	$(t-1)^2(t+t^2+1)$	1
	$t^2(t+t^2+1)$	6
triples	$\{t^4, t^4, t^4\}$	11

Col Number	Rank
1	1
2	2
3	2
4	1
5	1
6	1
7	2
8	1
9	1
10	1
11	2
12	2
13	2
14	1
15	1
16	4

Rs 16 - Soln 28

Type	Char. Poly.	Count
name-1		
symmetric	$t^3(t-1)$	9
	$(t-1)^2(t+t^2+1)$	1
	$t^2(t+t^2+1)$	6
triples	$\{t^4, t^4, t^4\}$	11

Col Number	Rank
1	2
2	1
3	2
4	2
5	2
6	2
7	1
8	1
9	1
10	1
11	1
12	1
13	1
14	1
15	4
16	2

Rs 16 - Soln 29

Type	Char. Poly.	Count
name-1		
symmetric	$t^3(t-1)$	9
	$(t-1)^2(t+t^2+1)$	1
	$t^2(t+t^2+1)$	6
triples	$\{t^4, t^4, t^4\}$	11

Col Number	Rank
1	2
2	1
3	4
4	1
5	1
6	2
7	2
8	2
9	1
10	1
11	1
12	1
13	1
14	2
15	2
16	1

Rs 16 - Soln 30

Type	Char. Poly.	Count
name-1		
symmetric	$t^3(t-1)$	9
	$(t-1)^2(t+t^2+1)$	1
	$t^2(t+t^2+1)$	6
triples	$\{t^4, t^4, t^4\}$	11

Col Number	Rank
1	2
2	1
3	1
4	2
5	2
6	1
7	2
8	1
9	1
10	2
11	1
12	1
13	4
14	1
15	2
16	1

Rs 16 - Soln 31

Type	Char. Poly.	Count
name-1		
symmetric	$t^3(t-1)$	9
	$(t-1)^2(t+t^2+1)$	1
	$t^2(t+t^2+1)$	6
triples	$\{t^4, t^4, t^4\}$	11

Col Number	Rank
1	1
2	4
3	1
4	1
5	1
6	2
7	1
8	1
9	2
10	2
11	2
12	2
13	1
14	1
15	2
16	1

Rs 16 - Soln 32

Type	Char. Poly.	Count
`name-1`		
symmetric	$t^3(t-1)$	9
	$(t-1)^2(t+t^2+1)$	1
	$t^2(t+t^2+1)$	6
triples	$\{t^4, t^4, t^4\}$	11
`name-2`		
symmetric	$t^3(t-1)$	9
	$(t-1)^2(t+t^2+1)$	1
	$t^2(t+t^2+1)$	6
triples	$\{t^4, t^4, t^4\}$	11
`name-3`		
symmetric	$t^3(t-1)$	9
	$(t-1)^2(t+t^2+1)$	1
	$t^2(t+t^2+1)$	6
triples	$\{t^4, t^4, t^4\}$	11

Col Number	Rank
1	4
2	2
3	2
4	2
5	2
6	1
7	1
8	1
9	2
10	1
11	1
12	1
13	2
14	1
15	1
16	1

Rs 16 - Soln 1
2, 3, 4, 5, 9, 13