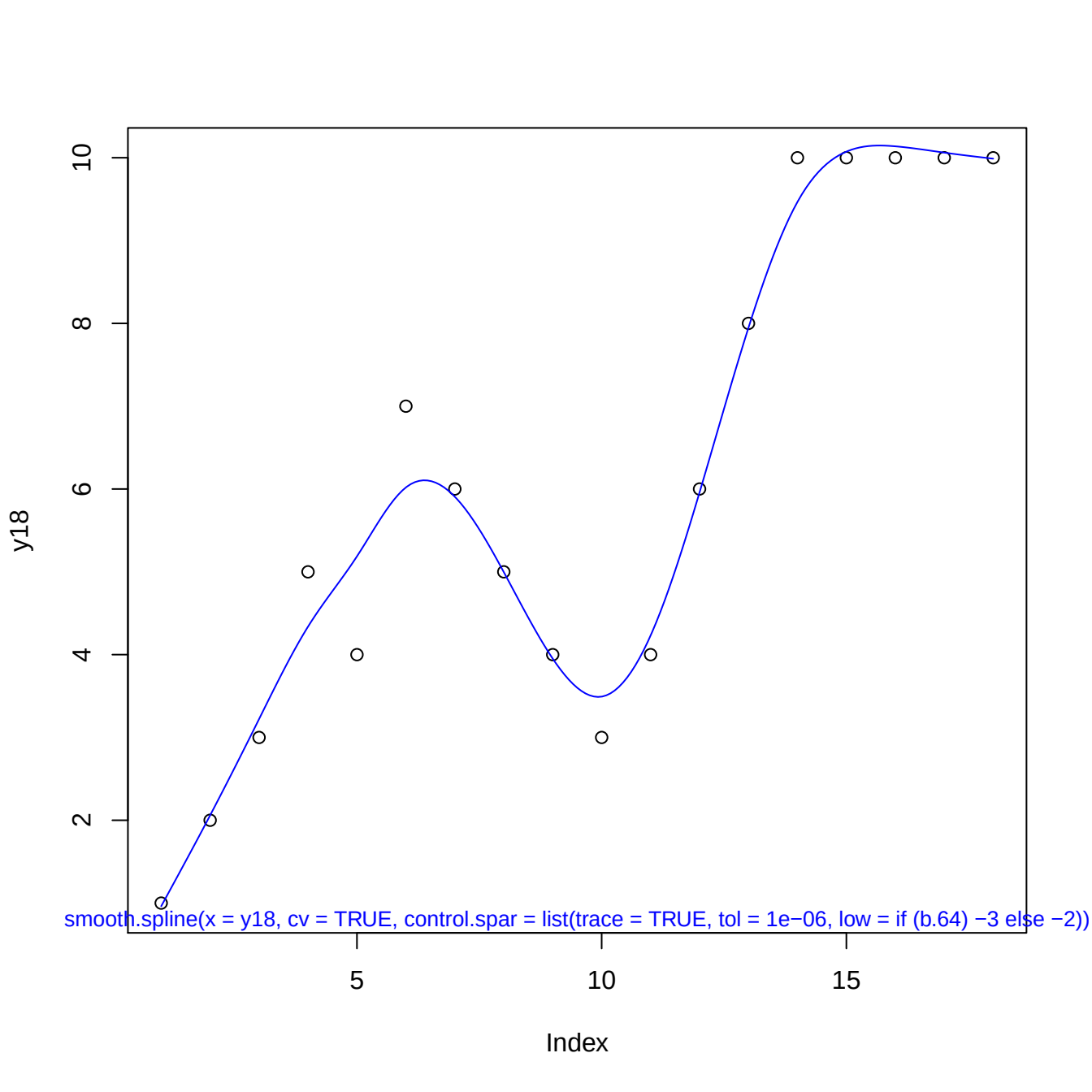
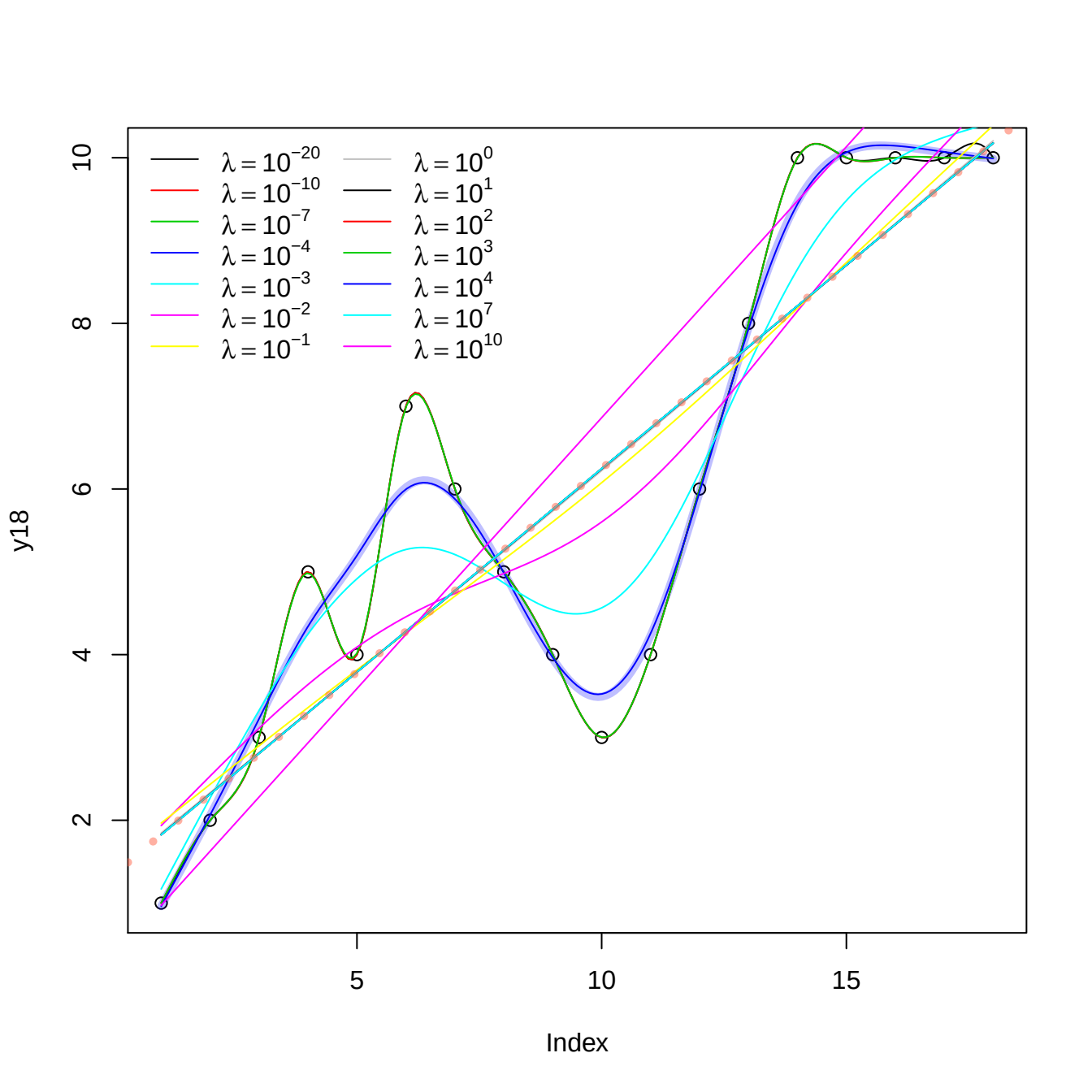
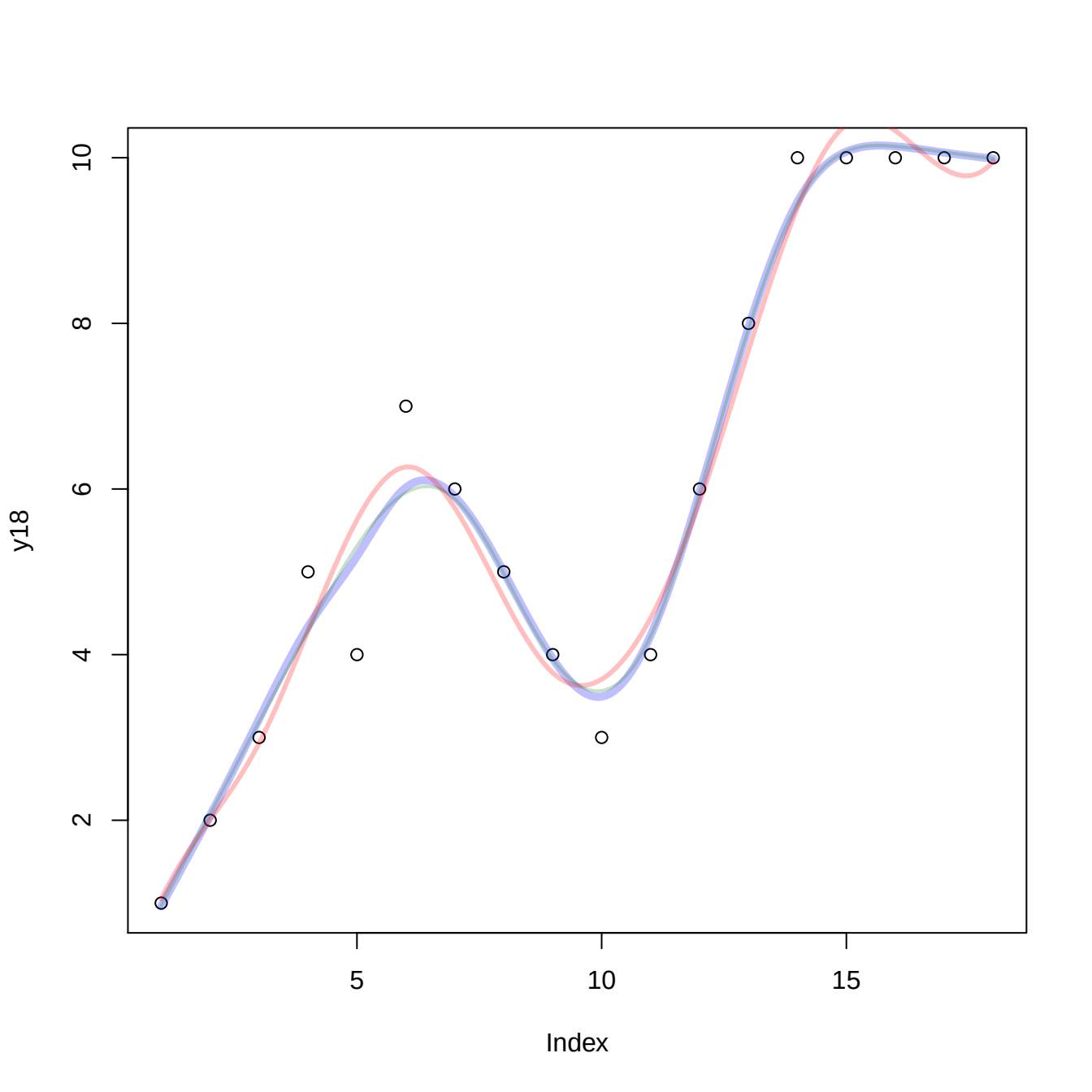
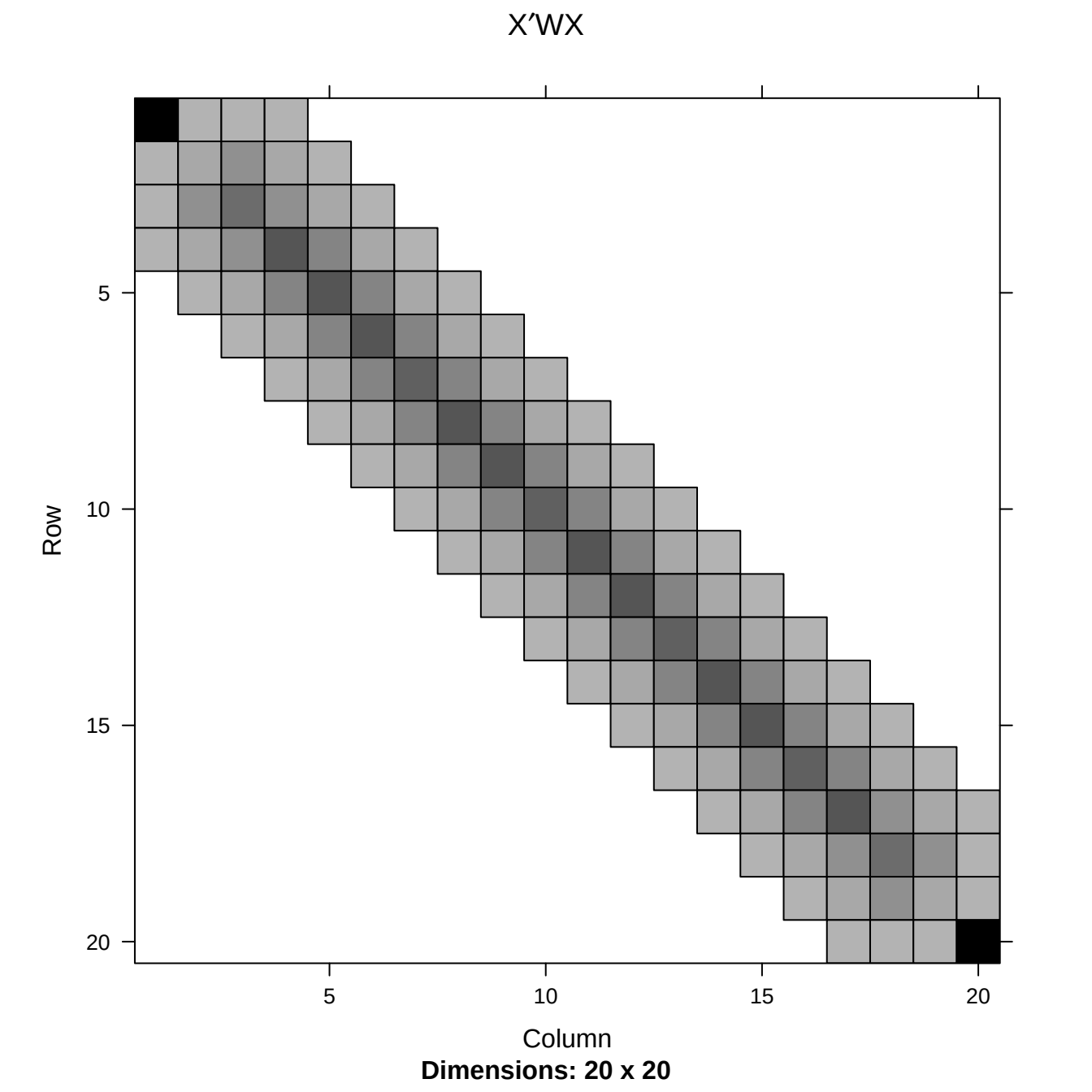
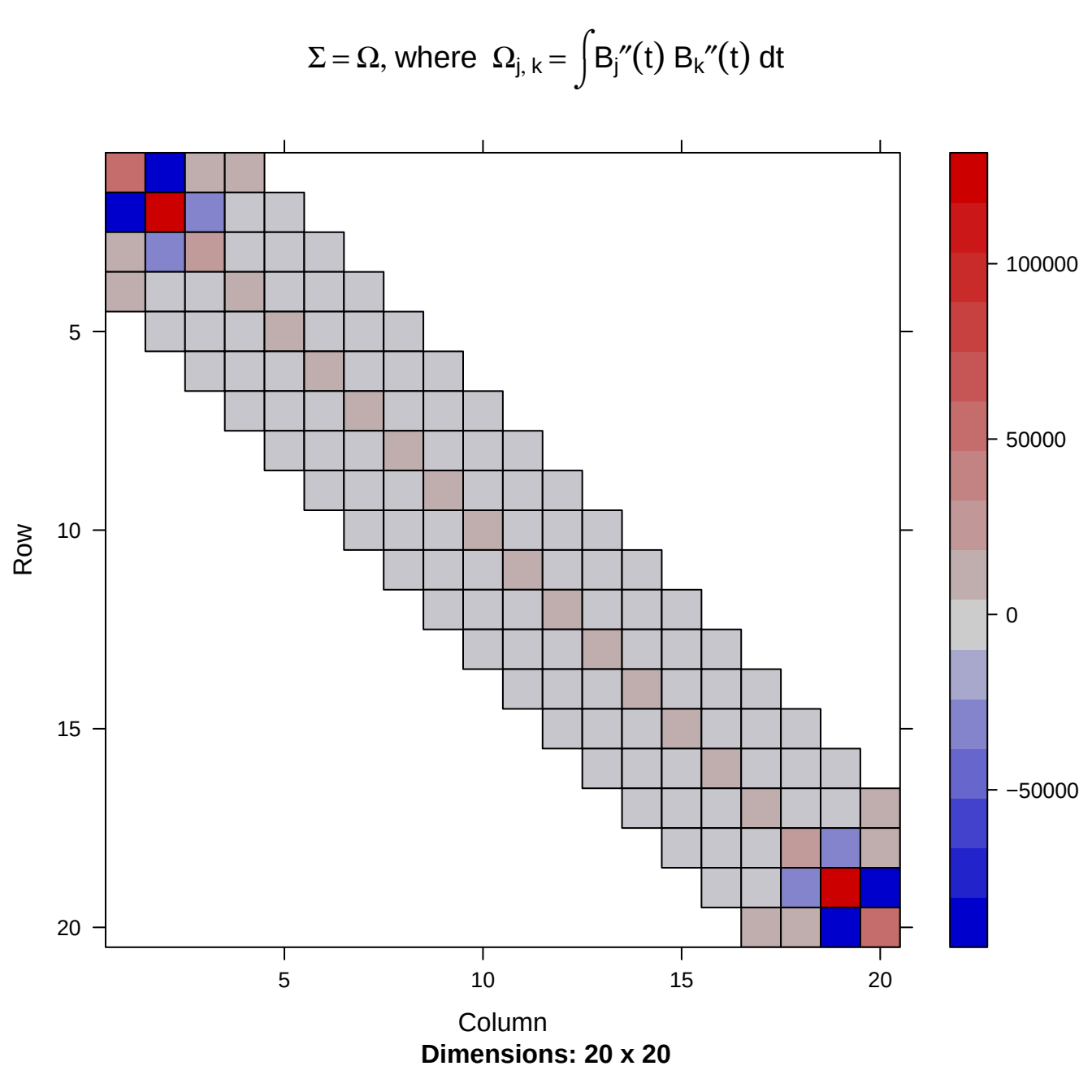
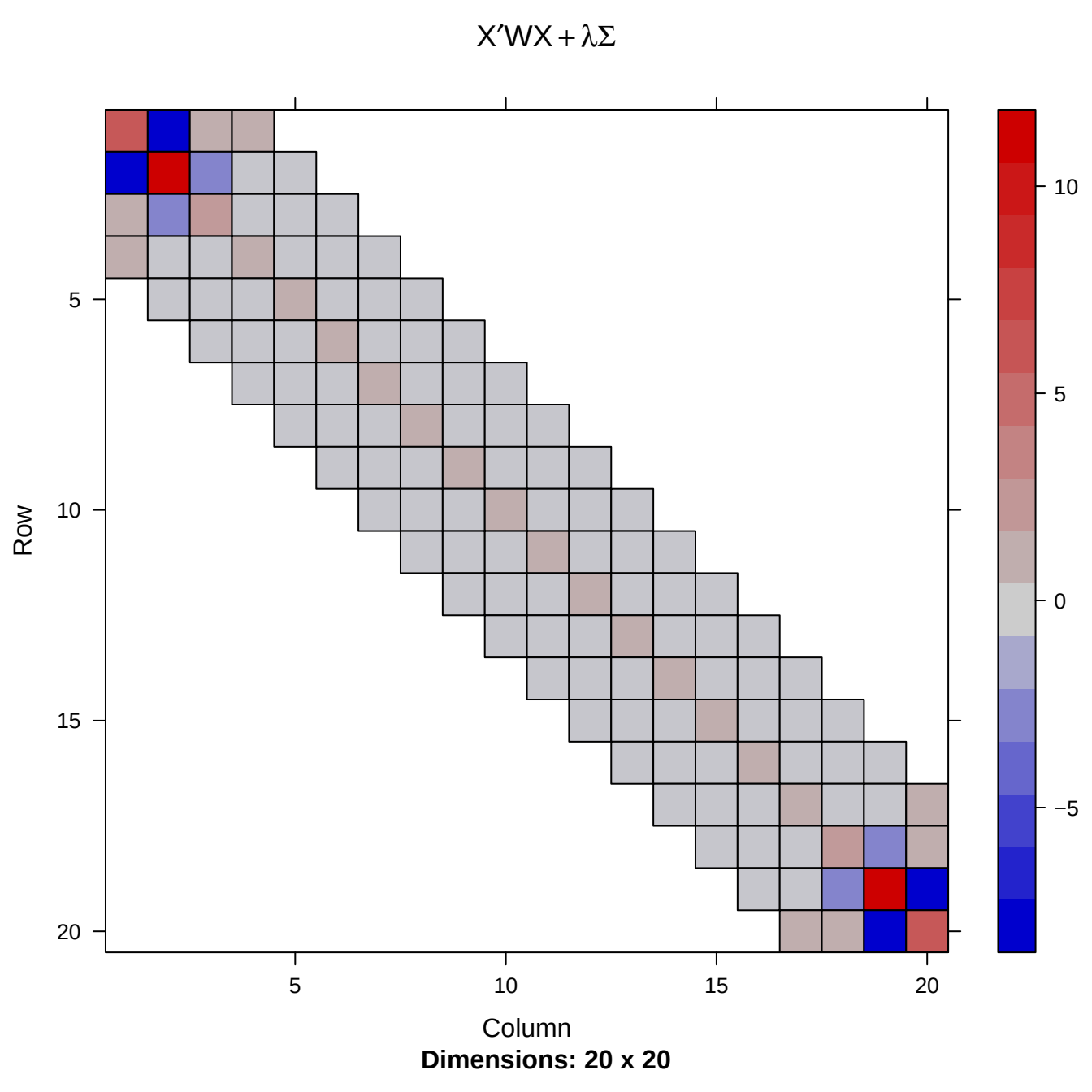

y18
Index
2
4
6
8
10
5
10
15
smooth.spline(x = y18, cv = TRUE, control.spar = list(trace = TRUE, tol = 1e−06, low = if (b.64) −3 else −2))

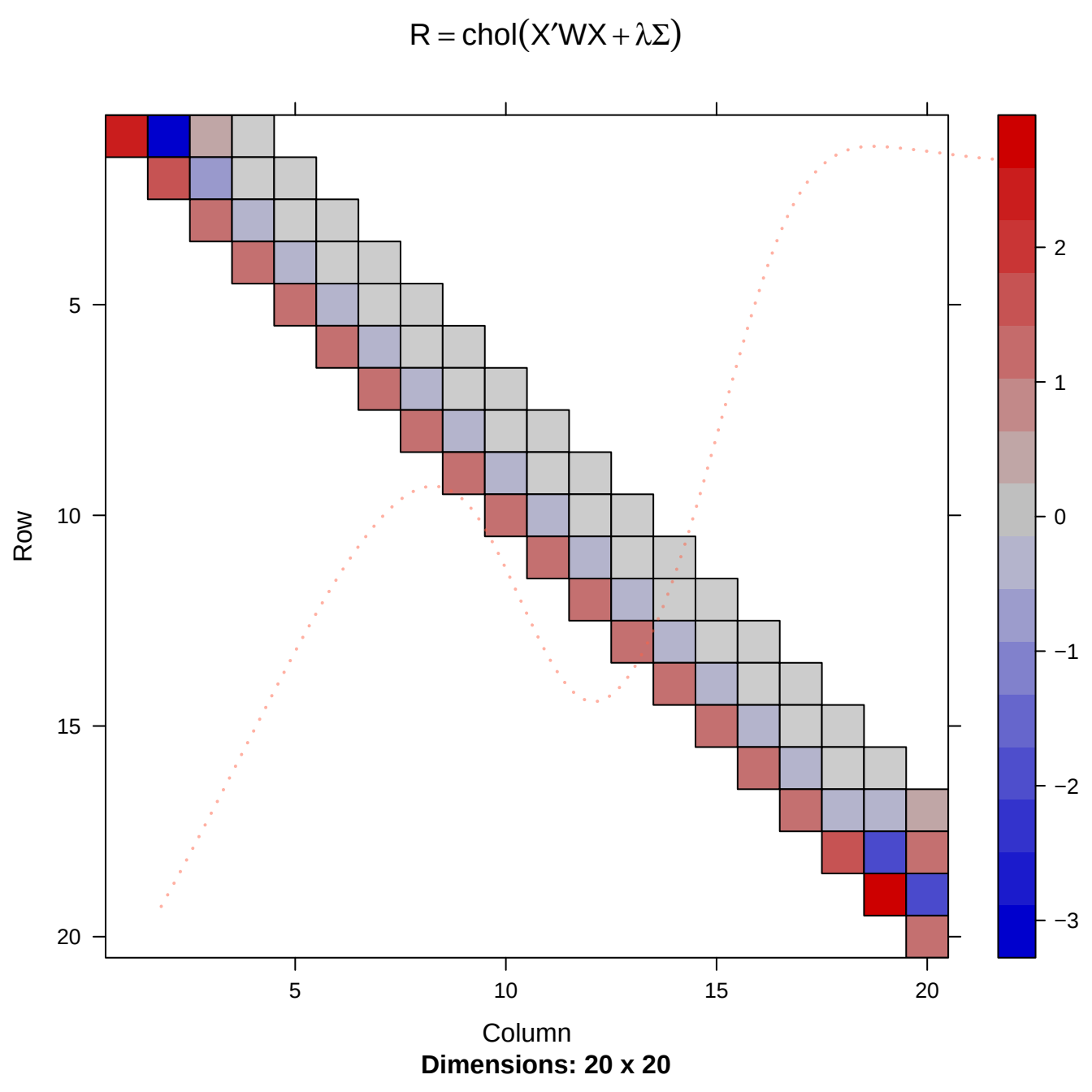

$\lambda = 10^{-20}$
$\lambda = 10^{-10}$
$\lambda = 10^{-7}$
$\lambda = 10^{-4}$
$\lambda = 10^{-3}$
$\lambda = 10^{-2}$
$\lambda = 10^{-1}$
$\lambda = 10^{0}$
$\lambda = 10^{1}$
$\lambda = 10^{2}$
$\lambda = 10^{3}$
$\lambda = 10^{4}$
$\lambda = 10^{7}$
$\lambda = 10^{10}$
y18
Index
2
4
6
8
10
5
10
15

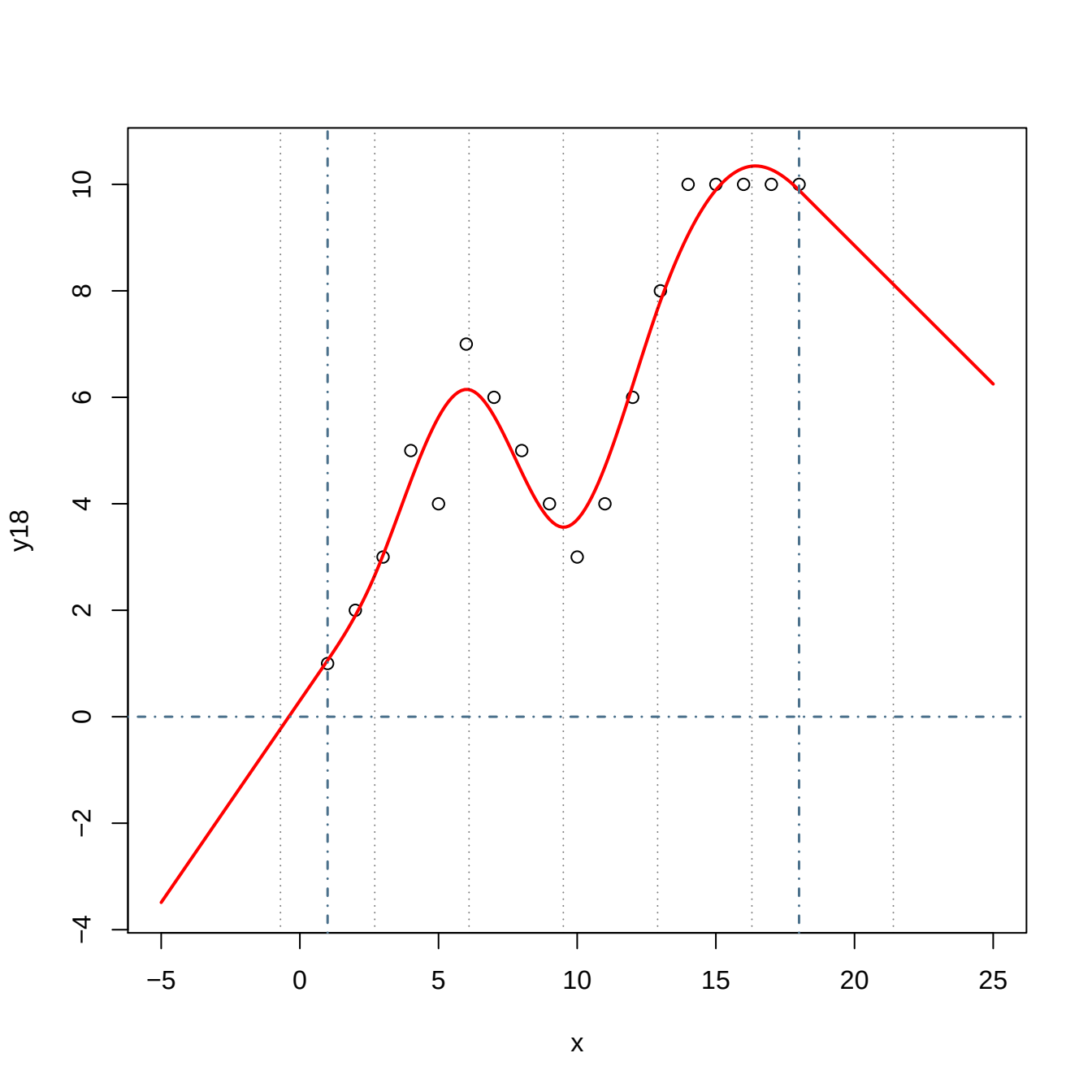

y18
Index
2
4
6
8
10
5
10
15

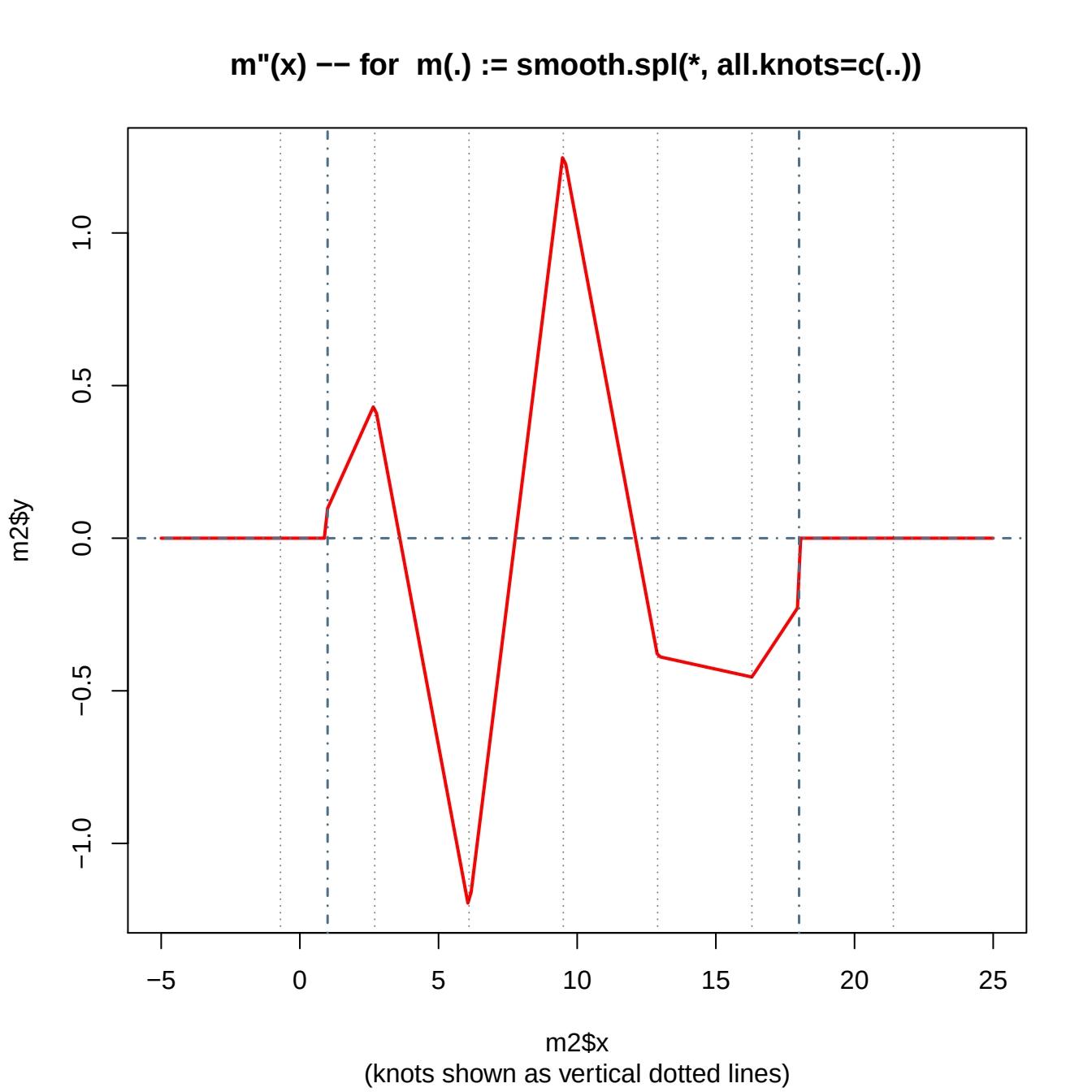

X'WX
Row
5
10
15
20
5
10
15
20
Column
Dimensions: 20 x 20

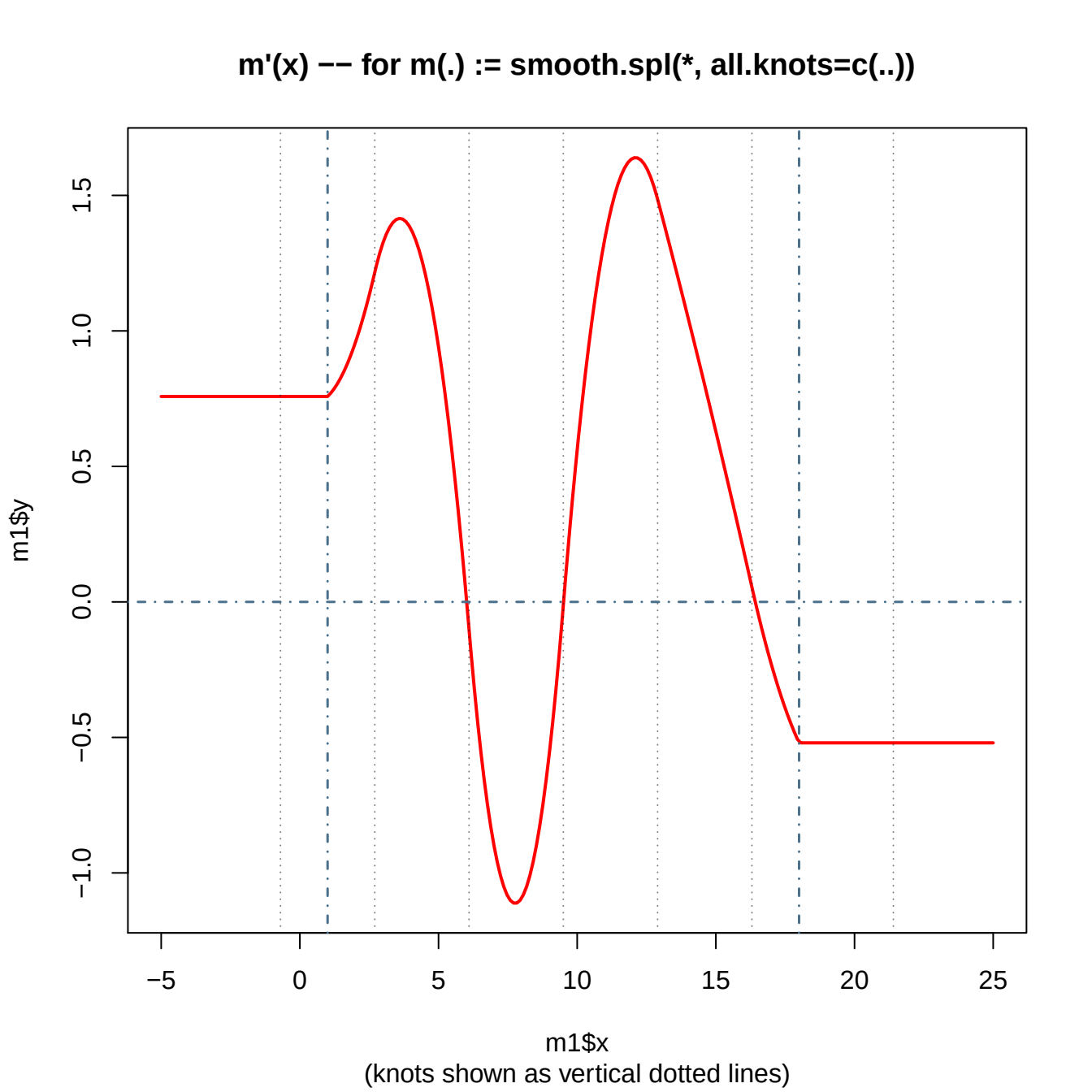

$\Sigma = \Omega$, where $\Omega_{j,k} = \int B_j''(t)\, B_k''(t)\, dt$
Row
Column
5
10
15
20
100000
50000
0
−50000
Dimensions: 20 x 20


X′WX + λΣ
Row
Column
Dimensions: 20 x 20
5
10
15
20
10
5
0
−5


$R = \text{chol}(X'WX + \lambda\Sigma)$
Row
Column
5
10
15
20
2
1
0
−1
−2
−3
Dimensions: 20 x 20


y18
x
−4
−2
0
2
4
6
8
10
−5
0
5
10
15
20
25


m"(x) −− for m(.) := smooth.spl(*, all.knots=c(..))
m2$y
1.0
0.5
0.0
−0.5
−1.0
−5
0
5
10
15
20
25
m2$x
(knots shown as vertical dotted lines)


m'(x) −− for m(.) := smooth.spl(*, all.knots=c(..))
m1$y
1.5
1.0
0.5
0.0
−0.5
−1.0
−5
0
5
10
15
20
25
m1$x
(knots shown as vertical dotted lines)