```
N = 178 = 2*89

By the Ibukiyama-Kitayama dimension formula,
 dim(S_4(K(178))) = 87

By the Skoruppa-Zagier dimension formula and Jacobi restriction,
 the lift dimension of S_4(K(178))^+ is 32
 the nonlift dimension of S_4(K(178))^+ is heuristically 44
 dim(S_4(K(178))^+) thus is heuristically 76
 dim(S_4(K(178))^-) is heuristically 11

The heuristic dimensions are correct by the spanning results to follow

dim(J_{2,178}^{cusp}) = 3 (Skoruppa-Zagier), so need to span to within 2 dimensions

q = 5 for TraceDown
After TD(Grit(J_{4,890}^{cusp})) and (Grit(J_{2,178}^{cusp}))^2,
 spanned rank in S_4(K(178))^+ is 76
 spanned rank in S_4(K(178))^- is 0

Hecke operators applied: {{{2, 2}}, {{2, 2}, {2, 1}}}
After Hecke spreading,
 spanned rank in S_4(K(178))^- is 8

After Borcherds products,
 spanned rank in S_4(K(178))^- is 11

Final spanned rank in S_4(K(178))^+ is 76
Final spanned rank in S_4(K(178))^- is 11

--------------------------------------------------------------------------------

S_2(K(178))^+ is determined by Jacobi restriction and the H4Nd1(2,+) test
 (dim(H_4(178,2,1)^+) <= 3 and this is less than dim(J_{2,178}^{cusp})+1 = 4)
S_2(K(178))^- = 0 by Jacobi restriction and the H4Nd1(1,-) test
 (dim(H_4(178,1,1)^-) <= 0 and this is less than dim(J_{2,178}^{cusp}) = 3)

So S_2(K(178)) = Grit(J_{2,178}^{cusp}) (dimension 3)
```