In this note we analyze "the" $D_5$ function, $f_{D_5}$, which we generate by:

- start with an ansatz of all distinct $f_{A_3}$'s in $D_5$,
- impose antisymmetry under all of the $D_5$ automorphisms $\{\sigma, \tau, \mathbb{Z}_2\}$,
- take the fully symmetric sum of this $f_{D_5}$ over $E_6$ and fit to $R_7^{(2)}$.

The resulting function has 1 free parameter, which represents an internal degree of freedom in $f_{D_5}$ that cancels in the symmetric sum over $E_6$. Later in the note we will explore tuning these free parameters to make some (tbd) nice property manifest.

### Reader's Digest: Deriving $f_{D_5}$

There are 65 distinct $A_3$'s in $D_5$. Of these, only 42 are linearly independent. Imposing full antisymmetry fixes 37 degrees of freedom, leaving us with only 5. Requiring that the fully symmetric sum of $f_{D_5}$ gives $R_7^{(2)}$ fixes 4 of these parameters, leaving us with only 1 parameter.

### Describing $f_{D_5}$

### Representing $R_7^{(2)}$ in terms of $f_{D_5}$

### Constraining the remaining parameters