Adapting * Nelder-Mead to n dims.

We have now seen how to implement Nelder-Mead on the plane.

In general, we have

\[ w \leftarrow \text{worst} \quad \text{second worst} \]

\[ G_3 = G \quad M = \frac{1}{3} (G_1 + G_2 + G_3) \]

\[ R = w + 2(M - w). \]

If we find \( f(R) < f(W) \), we will take it, replacing \( W \) with \( R \). If \( f(R) < f(B) \), we try to continue to \( E \).

If it doesn't improve things further, we stick with \( R \) (and stop), otherwise we take \( E \) (and stop).
We know now that $f(R) > f(B)$. If $f(R) > f(C)$, then we didn’t even beat the second-worst point. Try a contraction

$$C_1 = \frac{1}{2} (M + W)$$
$$C_2 = \frac{1}{2} (M + R)$$

If $f(C) > f(W)$, then attempt give up and shrink around B.

This is even simpler than the variant we gave for 2 dimensions.

As it turns out, this is built into Mathematica, making demos easy!