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A new proof of Baernstein's convolution inequality on the unit circle using geometric flow

The well-known Riesz-Sobolev inequality (or Riesz rearrangement inequality) asserts that for non-negative measurable functions f, g, and h on $\mathbb{R}^n$, the quantity $f * g * h(0)$ does not decrease when f, g, and h are replaced with their symmetric decreasing rearrangements. There is an analogous convolution inequality for non-negative measurable functions on S^1 due to Albert Baernstein, for which we provide a novel proof using a flow of measurable subsets of S^1.